सत्यमेव जयते

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

Minutes of 53RD EAC meeting River Valley and Hydroelectric Projects held from 29/04/2026 to 30/04/2026

Date: 07/05/2026

MoM ID: EC/MOM/EAC/730519/4/2026

Agenda ID: EC/AGENDA/EAC/730519/4/2026

Meeting Venue: N/A

Meeting Mode: Virtual

Date & Time:

29/04/2026	10:30 AM	05:30 PM
30/04/2026	10:30 AM	05:30 PM

1. Opening remarks

The 53rd meeting of the EAC for River Valley & Hydroelectric Projects organized by the Ministry of Environment, Forest and Climate Change, Indira Paryavaran Bhawan, Jor Bagh Road, New Delhi, was held on 29th April and 30th April, 2026 through Virtual Mode, under the Chairmanship of Prof. G. J. Chakrapani.

2. Confirmation of the minutes of previous meeting

The Minutes of the 52nd EAC meeting held on 13th April, 2026 were confirmed.

3. Details of proposals considered by the committee

Day 1 -29/04/2026

3.1. Agenda Item No 1:

3.1.1. Details of the proposal

Environmental Clearance for Jethala Balancing Reservoir Lift Irrigation Project having CCA of 29000 Ha., District: Sehore, State: Madhya Pradesh by Water Resources Division, Sehore, Madhya Pradesh by **WATE R RESORCES DIVISION, SEHORE** located at **SEHORE,MADHYA PRADESH**			
Proposal For		Fresh ToR	
Proposal No	**File No**	**Submission Date**	**Activity Sub-Activity (Schedule Item)**
IA/MP/RIV/572528/2026	J-12011/17/2026-IA.I(R)	15/04/2026	River Valley/Irrigation proje cts Irrigation Projects (1(c))

3.1.2. Project Salient Features

53.1.1 The proposal is for grant of Terms of Reference (ToR) to the project for Jethala Balancing Reservoir Lift Irrigation Project (CCA of 29000 Ha) in an area of 1242.13Ha located at Sub district Narsinghgarh, Berasia, Huzur and Shyampur, District Sehore and Bhopal, Madhya Pradesh by M/s Water Resources Division, Sehore, Madhya Pradesh.

53.1.2 The Project Proponent and the accredited Consultant M/s Techknowgreen Solutions Limited, Pune, Maharashtra, made a detailed presentation on the salient features of the project and informed that:

i. The Jethala (Balancing Reservoir) Lift Irrigation Project is proposed under Modified Parbati–Kalisindh–Chambal (PKC) Link Project near village Jetla, Tehsil Shyampur, District Sehore, Madhya Pradesh.

ii. The project envisages the construction of a balancing reservoir across a tributary of the Parbati River with a gross storage capacity of 102.76 MCM. The scheme involves lifting water from the submergence of the existing Parbati (Rinsi) Dam and conveying it through a pressurized micro-irrigation network to irrigate a Culturable Command Area (CCA) of 29,000 ha with 100% irrigation intensity by utilizing 94.289MCM of water, along with provision of 1 MCM for domestic water supply.

iii. Water Resources Department, Government of Madhya Pradesh, vide letter dated 31/12/2024, has accorded administrative approval to the Jethala Balancing Reservoir Lift Irrigation Scheme under the Modified Parbati–Kalisindh–Chambal Link Project to irrigate a command area of 29,000 ha.

iv. The project includes construction of a zoned earthen dam of 1,575 m length and 30.91 m height, along with feeder, main and booster pump houses, and an underground pressurized pipe distribution system. Water will be conveyed through rising mains of varying diameters to serve the entire command area. The total installed power requirement for the system is estimated at 23.26 MW. The command area 29,000 Ha. with current cropping intensity of 7,250 Ha. will achieve 100% irrigation intensity after project implementation. The project also envisages fisheries development and provides drinking water benefits to a population of 0.40 Lakhs.

v. **Brief Description of Nature of the Project:** The Jethala Balancing Reservoir Lift Irrigation Project envisages construction of dam (balancing reservoir) of 1575m length and 30.91 maximum height, near Jetla village, tehsil Shyampur, District Sehore across local river;

tributary of Parbati river in Parbati sub basin. To irrigate 29000 ha, a pump house (PH-1) is proposed at Parbati river upstream of Parbati Rishri dam keeping the MDDL of pump house at FRL of Parbati Rishri dam. PH-1 will be used as a feeder pump house to feed Jethala balancing reservoir from Parbati river during monsoon season. For this purpose, a MS pipe Line of dia 2.90 m and 10 km length is to be laid from PH-1 to Jethala dam (Balancing Reservoir). Another pump house will be constructed near Jethala Dam (Balancing Reservoir) from which a rising main of maximum 2.7 m diameter MS Pipe to irrigate 24,200 Ha. and another booster pump house is proposed having rising main of 1.3 m diameter MS Pipe to irrigate 4,800 Ha.

vi. The proposed dam site is located across Local River tributary of Parbati river near the villageJetla in the Shyampur tehsil located on toposheet No. 55 E/2 in Sehore district of Madhya Pradesh. The latitude and longitude of the dam site are 23°35′00″ N and 77°13′00″ E respectively.

vii. The Jethala Balancing Reservoir Lift Irrigation Project envisages construction of a balancing reservoir with a gross storage capacity of 102.76 MCM across a tributary of the Parbati River near village Jetla, Tehsil Shyampur, District Sehore, Madhya Pradesh.

viii. **Land requirement:** The proposed Jethala Balancing Reservoir Lift Irrigation Project will involve submergence of land across eight villages, namely Jetla, Kushalpura, Jugrajpura, Lodhipura, Magarda, Mungaoli, Patera and Silkheda. The total non-forest land affected is 1,047.99 ha, while forest land involved is about 194.14 ha. Thus, the total submergence area of the project is approximately 1,242.13 ha.

ix. **Water requirement:** About 101 MCM of water will be lifted from the submergence area of the existing Parbati Rinsi Dam. The total water requirement for irrigation is 94.289 MCM and domestic purpose is 1MCM.

x. **Project Cost**: The estimated project cost is Rs ₹ 1349.51 crore; The proposal have been submitted at the Central Water Commission on 02/12/2026 on e-pams portals for obtaining approval on the revised project cost of Rs. 155627.86 lakhs; the approval is awaited.

xiv. **Resettlement and rehabilitation:**

xv. **Alternative Studies:** The reservoir site was selected based on contour map analysis, identifying the location with the maximum feasible storage capacity. The command area has been delineated in a site-specific manner to address water-deficit regions of Sehore district, enabling both irrigation and domestic water supply through a micro-irrigation distribution system.

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

Waste Type	Quantity	Source	Management Method
Biodegradable waste	71.46 kg/day	Labour camps	Composting through Gram Panchayat / ULB
Non-biodegradable waste	47.64 kg/day	Construction activities	Authorised recyclers / disposal as per SWM Rules, 2016
Plastic waste (cement bags)	0.71 TPA	Construction activities	Collection and disposal through authorised recyclers

Used / Spent oil (Hazardous)	18.35 litres/annum	DG sets	Stored in designated containe rs and disposed through auth orised recyclers
Muck	7,33,855.38 m^3,	Excavation	Reused in construction activiti es

xviii. The salient features of the Jethala Balancing Reservoir Lift Irrigation Project dare as under :-

· **Project Details**

Name of the Proposal	Environmental Clearance for Jethala B alancing Reservoir Lift Irrigation Proje ct having CCA of 29000 Ha., District: Sehore, State: Madhya Pradesh by Wa ter Resources Division, Sehore, Madh ya Pradesh
Location (Including coordinates)	Village: Jetla, Tehsil: Shyampur District: Sehore State: Madhya Pradesh Latitude: 23° 34' 31.14" N, Longitude: 77° 13' 1.7" E
Inter- state issue involved	No
Seismic zone	Zone II

· **Category of details**

Category of the project	A
Provisions	The project falls under Major Irrigati on System (≥ 10,000Ha.), under (ii) Irrigation projects of 1 (c) River Vall ey as per the Environmental Impact Assessment (EIA) Notification, 2006 and its subsequent amendment date d 20th April, 2022.
Capacity / Cultural command area (CCA)	29,000
Attracts the General Conditions (Yes/No)	Yes
Additional information (if any)	Presence of Narsinghgarh Wildlife S anctuary and its Eco-Sensitive Zone within the 10km radial distance fro m the project site

· **ToR/EC Details**

Cost of project	Approved cost : 1349.51 crore; Furt her, the proposal have been submitt

	ed at the Central Water Comission o n 02/12/2026 on e-pams portals for obtaining approval on the revised pr oject cost of Rs. 155627.86 lakhs; t he approval is awaited.
Total area of Project	Land requirement : 1,242.13 Ha.
Height of Dam from River Bed (EL)	NA
Length of Tunnel/Channel	Not any
Details of Submergence area	1242.13 Ha.
Types of Waste and quantity of generation during construction/ Operation	Construction Phase: Muck: 7,33,855.38 Cu.m. Wastewater: 14.29 KLD Solid waste: ¾ Biodegradable waste: 71.46 Kg/da y ¾ Non Biodegradable waste: 47.64 Kg/day ¾ Plastic waste (cement bags): 0.71 TPA Used/Spent Oil from DG set: 18.35 L itres/year
E-Flows for the Project	Provision of two sluices at RD 255 m and RD 465 m has been made in the earthen Jethala dam (Balancing Reser voir) for environmental flow release and emergency depletion of the rese rvoir.
Is Projects earlier studies in Cumulative Impact ass essment & Carrying Capacity studies (CIA&CC) for River in which project located. If yes, then a) E-flow with TOR /Recommendation by EAC as per CIA&CC study of River Basin. b) If not the E-Flows maintain criteria for sustai ning river ecosystem.	No

· **Muck Management Details:**

No. of proposed disposal area/(type of land-Forest/Pvt. land)	Not any
Muck Management Plan	· Total muck generated : 7,33,855.38 Cu.m. · The total quantity of Hard soil/ Hard muru m (4,70,856.67 Cu.m.) and Hard rock (6 5749.68 Cu.m.) generated will be utilized for construction activity

	· The remaining quantity of muck i.e. 1,97,249.03 Cu.m. of D.R./S.R. will be utilized for road development.
Monitoring mechanism for Muck Disposal	All the muck generated will be utilized

Private land	817.16 Ha
Government land	230.83 Ha
Forest Land	194.14 Ha
Total Land	1242.13 Ha
Submergence area/Reservoir area	1242.13 Ha
Additional information (if any)	-

· **Presence of environmentally Sensitive areas in the study area**

Forest Land/ Protected Area/ Environmental Sensitivity Zone	**Yes/No**	**Details of Certificate/letter/Remarks**
Reserve Forest/Protected Forest Land	Yes	· RF near Lodhipura Village at a distance of 0.3km (NNE) from Jethla Dam submergence area · Protected Forest near Chanderi village at a distance of 1.8Km (ESE) from the Command Boundary · Narsinghgarh Wildlife Sanctuary at a distance of 1.27Km (NW) from the feeder pump house
National Park	No	
Wildlife Sanctuary	Yes	

· **Court case details: Nil**

· **Previous EC compliance and necessary approvals**

Particulars	**Letter no. and date**
Certified EC compliance report (if applicable)	NA
Status of Stage- I FC	Submission of application for obtaining Forest Clearance for 194.14Ha. of forest land is under process.
Additional detail (If any)	The MoU and MoA for this Jethala Balancing Reservoir Lift Irrigation Scheme was signed between Madhya Pradesh, Rajasthan and Central Government on 28th January, 2024 and 05th December, 2024, respectively.

Is FRA (2006) done for FC-I	

· **Miscellaneous**

Particulars	**Details**
Details of consultant	Techknowgreen Solutions Limited Address: 202, Hem Opal, Ekta Park Society, Wakdewadi, S hivaji nagar, Pune, Maharashtra- 411005. NABET Accreditation: NABET/EIA/24-27/SA 0271; Valid up to July 05, 2027
Project Benefits	1) Provision of Irrigation Benefits to a command area of 2 9,000 Ha. at 100% irrigation intensity to a total 113 villag es in the water - deficit region of Sehore District 2) Provision of 1 MCM drinking water 3) Opportunities for fisheries development - 308.99 tonn es of fish production per year 4) Improvement in the socio-economic development and livelihood of the inhabitants 5) Social infrastructure development as a part of local Ar ea development Plan under CER 6) Improvement in the micro-climatic conditions of the re gion through greenbelt development 7) Employment opportunities during construction and op erational phase of the project
Status of other statutory clea rances	Submission of application for obtaining Forest Clearance fo r 194.14Ha. of forest land is under process.
R&R details	**Total Private Land Acquisition:** 819.16 Ha across 9 villag es **Submergence Area:** 817.16 Ha across 7 villages · Jetla · Kushalpura · Lodhipura · Magarda · Mungaoli · Patera **Land for Project Components:** · Gawa: 1 Ha (PH-2) · Barkheda Kharet: 1 Ha (Booster Pump House) The survey for project affected families/ properties is curre ntly under progress and the details of the same shall be inc luded in the EIA report.
Additional detail (If any)	

3.1.3. Deliberations by the committee in previous meetings

N/A

3.1.4. Deliberations by the EAC in current meetings

53.1.3 The EAC during deliberations noted the following:

- The EAC deliberated on the information submitted (Form 1, PFR, kml file, etc.) and as presented in the meeting and observed that the proposal is for grant of TOR for conducting EIA study for Jethala Balancing Reservoir Lift Irrigation Project (CCA of 29000 Ha) in an area of 1242.13Ha located at Sub district Narsinghgarh, Berasia, Huzur and Shyampur, District Sehore and Bhopal, Madhya Pradesh by M/s Water Resources Division, Sehore, Madhya Pradesh.

- The EAC noted that the present project proposal comes under "B1" category; as per the provisions of the EIA Notification, 2006, as amended as Culturable Command Area (CCA 29,000 ha). However, the project components are falling in the Narsinghgarh Wildlife Sanctuary Eco-Sensitive Zone hence, it requires appraisal at the Central level by the Expert Appraisal Committee (EAC).

- The EAC observed that the Jethala (Balancing Reservoir) Lift Irrigation Project is proposed under Modified Parbati– Kalisindh–Chambal (PKC) Link Project near village Jetla, Tehsil Shyampur, District Sehore, Madhya Pradesh. The proposed project envisages construction of a balancing reservoir with a gross storage capacity of 102.76 MCM across a tributary of the Parbati River. The scheme involves lifting water from the submergence of the existing Parbati (Rinsi) Dam and conveying it through a pressurized micro-irrigation network to irrigate a Culturable Command Area (CCA) of 29,000 ha with 100% irrigation intensity by utilizing 94.289MCM of water, along with provision of 1 MCM for domestic water supply.

· The EAC noted that the total land required for the project is estimated to be 1,242.13 ha. Out of which, non-forest land affected is 1,047.99 ha (private land is 817.16 Ha and government Land is 230.83 Ha) and forest land involved is about 194.14 ha. Diversion of forest land for non-forest purpose will be involved for construction of project components. Further, it was observed that the application for Stage-I Forest Clearance (FC) has been submitted on 18/02/2026 vide proposal no. FP/MP/HYD/IRRIG/569550/2026.

· The EAC noted with concern that the feeder Pump House and the Northern portion of the command area falls in the Narsinghgarh Wildlife Sanctuary Eco-Sensitive Zone. The Ministry of Environment, Forest and Climate Change vide Notification S.O. 3689(E) dated 27th July, 2018 has notified the Eco-Sensitive Zone (ESZ) around the sanctuary, wherein a monitoring committee has been constituted for effective monitoring of the Eco-Sensitive Zone. It is inter-alia mentioned in the ESZ notification that the activities that are covered in the Schedule to the notification of the Government of India in the erstwhile Ministry of Environment and Forests number S.O. 1533(E), dated the 14th September, 2006, and are falling in the Eco-sensitive Zone, except for the prohibited activities as specified in Table under paragraph 4 thereof, shall be scrutinised by the Monitoring Committee based on the actual site-specific conditions and referred to the Central Government in the Ministry of Environment, Forest and Climate Change for prior environmental clearances under the provisions of the said notification.

- In view of the above, the EAC opined that the Project Proponent should submit recommendations of the above-mentioned Monitoring Committee before taking any decision on the proposal by the EAC.

53.1.4 The EAC based on the information submitted and as presented during the meeting, and in view of the above provisions and regulatory restrictions, decided to ***defer*** the proposal for grant of Terms of Reference for conducting EIA study for proposed construction of Jethala Balancing Reservoir Lift Irrigation Project (CCA of 29000 Ha) in an area of 1242.13Ha located at Sub district Narsinghgarh, Berasia, Huzur and Shyampur, District Sehore and Bhopal, Madhya

Pradesh by M/s Water Resources Division, Sehore, Madhya Pradesh.
The proposal was ***deferred*** on the following point.

3.1.5. Recommendation of EAC

Deferred for ADS

3.2. Agenda Item No 2:

3.2.1. Details of the proposal

Environmental Clearance for Bodwad Parisar Sinchan Yojana at Taluka Bodwad, District Jalgaon, Maharashtra by Tapi Irrigation Development Corporation, Jalgaon by **Tapi Valley Survey & Investigation Divisional Unit** located at **JALGAON,MAHARASHTRA**			
Proposal For		Fresh ToR	
Proposal No	**File No**	**Submission Date**	**Activity Sub-Activity (Schedule Item)**
IA/MH/RIV/572754/2026	J-12011/12/2026-IA.I(R)	14/04/2026	River Valley/Irrigation projects Irrigation Projects (1(c))

3.2.2. Project Salient Features

53.2.1 The proposal is for grant of Terms of Reference (ToR) to the project for Bodwad Parisar Sinchan Yojana (CCA of 53,025 Ha) in an area of 1315.13 Ha located at Sub District Jamner, Motala, Muktainagar (Edlabad), Malkapur and Bodvad, District Jalgaon and Buldana, Maharashtra by M/s Tapi Irrigation Development Corporation, Jalgaon.

53.2.2 The Project Proponent and the accredited Consultant M/s Techknowgreen Solutions Limited, Pune, Maharashtra, made a detailed presentation on the salient features of the project and
informed that:

i. The Bodwad Parisar Sinchan Yojana is proposed for development in the Tapi River Basin within Jalgaon District of Maharashtra. The project envisages lifting a total of 198.54 Mcum (7.01 TCM) of monsoon floodwater flowing from the submergence area of Hatnur Dam near Khamkheda Bridge close to Muktainagar village on the Purna River and store the lifted water in the proposed storage reservoirs, namely Junone and Jamthi.
ii. Tapi Irrigation Development Corporation, Jalgaon, Govt. of Maharashtra vide Order No. तापीपावि/का.सं./बोदडि/तृतीय सुधारति/०२/२०२२ dated 20/04/2022 accorded third revised administrative approval to the Bodwad Parisar Sinchan Yojana as per the 2018–19 Schedule of Rates, with a sanctioned cost of ₹3,763.60 crore for the Irrigable Command Area of 42,420 Ha. and Irrigation Potential of 53,449 Ha .
iii. A total of 197.574 Mcum of water will be utilized to irrigate a total Irrigable Command Area (ICA) of 42,420 hectares, with a Culturable Command Area (CCA) of 53,025 hectares and an Ultimate Irrigation Potential (UIP) of 53,449 hectares. On completion, the scheme will provide assured irrigation benefits to 101 villages constituting 63 villages in Jalgaon District and 38 villages in Buldhana District. In Jalgaon District, the notified command area of 26,811 hectares is distributed across Bodwad (18,574 ha), Jamner (6,339 ha), and

Muktainagar (1,897 ha) talukas. In Buldhana District, a total notified command area of 15,610 hectares is proposed to be served through Malkapur (8,035 ha) and Motala (7,575 ha) talukas.

iv. The scheme is proposed to be implemented in two stages;

v. The existing crop pattern in the command area is predominantly rainfed, with Kharif crops occupying the majority of the cultivated area having a net agricultural income of ₹15,315.91 lakh under pre-irrigation conditions. Whereas, under post-project irrigated conditions, adoption of a diversified and high-intensity cropping pattern with a greater share of perennial, vegetable, and Rabi crops have been proposed, thereby, increasing the cropping intensity to 146% with a net agricultural income of ₹1,15,773.12.

vi. This project is a joint project of the Vidarbha Irrigation Development Corporation (VIDC) and the Tapi Irrigation Development Corporation (TIDC). Of the total I.C.A. of 42,420Ha., 15,699 Ha. pertain to the balance command area in Buldhana District under Vidarbha Irrigation Development Corporation, and 26,721 hectares pertain to Jalgaon District under Tapi Irrigation Development Corporation. In the total project cost, the share of VIDC is 37%, while the share of TIDC is 63%.

vii. The geographical co-ordinate of the project are:

· Junone Dam: 20^0 57' 00"N, 76^0 00' 00"E

viii. Ministry had issued Environmental Clearance earlier vide letter no. J-12011/3/2009-IA.I dated 19/04/2010 to the existing project Bodwad Parisar Sinchan Yojana in favour of M/s. Design Divisional Unit, Tapi Irrigation Development Corporation.

ix. **Land requirement:**

x. **Water requirement:** A total of 198.54 Mcum will be lifted from the bank of the Purna river and the proposed water utilization is 197.574Mcum

xi. **Project Cost:** The estimated project cost is Rs. 3763.60 Crores including existing investment of Rs. 1,508.23 crores.

xii. **Project Benefit:**

xiii. **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. River/ water body Purna river is flowing at a distance of 0.12km from 1A Pump House in North direction.

xiv. **MoU / any other clearance/ permission signed with State government:**

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

Component	Quantity	Management Plan
Wastewater (Construction Phase)	34.24 KLD	Treated through mobile STPs
Biodegradable Solid Waste	171.36 kg/day	Segregated and handed over to local authority for composting
Non-Biodegradable Solid Waste	114.24 kg/day	Segregated and disposed through authorized recyclers/municipal facilities
Plastic Waste (Cement Bags)	6.5675 TPA	Collected separately and sent to CPCB/SPCB authorized recyclers

Hazardous Waste (Used Oil from D G Set)	22.35 Litres/ye ar	Stored in designated containers an d disposed through authorized rec yclers
Muck Generation	1,00,15,547.27 m^3	88,91,139.05 m^3 reused in backfilli ng; balance 11,24,408.22 m^3 used for land levelling, road works & sit e development

xviii. Status of Litigation Pending against the proposal, if any. NO
xix. The salient features of the project are as under:
· **Project Details**

Name of the Proposal	Environmental Clearance for Bodwad Pari sar Sinchan Yojana at Taluka Bodwad, Dis trict Jalgaon, Maharashtra by Tapi Irrigati on Development Corporation, Jalgaon
Location (Including coordinates)	Village: Muktainagar, District: Jalgaon, State: Maharashtra Junone Dam: 20^0 57' 00"N, 76^0 00' 00"E Jamthi Dam: 20^0 49' 00"N, 75^0 58' 30"E
Inter- state issue involved	No
Seismic zone	Zone II and Zone III
Category of the project	A
Provisions	The project falls under Major Irrigation S ystem (> 10,000Ha.), under (ii) Irrigation projects of 1 (c) River Valley as per the Environmental Impact Assessment (EIA) Notification, 2006 and its subsequent a mendment dated 20th April, 2022.
Capacity / Cultural command area (CCA)	53,025 Ha.
Attracts the General Conditions (Yes/No)	Yes
Additional information (if any)	The Maharashtra-Madhya Pradesh Inters tate boundary lies at a distance of 9.20K m north-east side from Stage-IA Pump House located on the Purna river.
Cost of project	₹ 3,763.60 crore
Total area of Project	Land requirement - 1315.13 Ha
Height of Dam from River Bed (EL)	Junone Dam : 46.90m; Jamthi Dam : 27.8 5m

Length of Tunnel/Channel	Not any
Details of Submergence area	Junone Dam: 524 Ha.; Jamthi Dam: 667.75 Ha.
Types of Waste and quantity of generation during construction/ Operation	Construction Phase: Muck: 1,00,15,547.27Cu.m. Wastewater: 34.24 KLD Solid waste: ¾ Biodegradable waste : 171.36Kg/day ¾ Non-biodegradable waste: 114.24 Kg/day ¾ Plastic waste (cement bags): 6.5675 TPA Used/Spent Oil from DG set: 22.35 Litres/year
E-Flows for the Project	NA
Is Projects earlier studies in Cumulative Impact assessment & Carrying Capacity studies (CIA&CC) for River in which project located. If yes, then a) E-flow with TOR /Recommendation by EAC as per CIA&CC study of River Basin. b) If not the E-Flows maintain criteria for sustaining river ecosystem.	No

Muck Management Details

No. of proposed disposal area/(type of land-Forest/Pvt. land)	NA
Muck Management Plan	· Total muck generated: 1,00,15,547.27 m³ due to excavation for components such as pump houses, jackwell, intake structures, rising mains, and distribution network · Muck reused for backfilling: 88,91,139.05 m³ i.e. 88.77% · The remaining 11,24,408.22 m³ of muck will be utilized for land leveling, road works, and site development etc.
Monitoring mechanism for Muck Disposal	NA

Private land	642.9
Government land	46.2
Forest Land	626.03

Total Land	1315.13
Submergence area/Reservoir area	Junone Dam: 524Ha.; Jamthi Dam: 667.75Ha.
Additional information (if any)	-

· **Presence of environmentally Sensitive areas in the study area**

Forest Land/ Protected Area/ Environmental Sensitivity Zone	**Yes/No**	**Details of Certificate/letter/Remarks**
Reserve Forest/Protected Forest Land	Yes	Reserve Forest near Amadgaon
National Park	No	
Wildlife Sanctuary	No	

· **Court case details**:NIL

· **Previous EC compliance and necessary approvals**

Particulars	**Letter no. and date**
Certified EC compliance report	Submitted request letter to RO, Nagpur for Certified Compliance Report
Status of Stage- I FC	**For Forest Land of 507.31Ha.** · MoEF, GoI vide letter F. No. 8-50/2001-FC/2544 dated 17/07/2001 accorded Stage-I FC; · Further, MoEF, GoI vide letter No. F-8-50/2001-FC dated 11/03/2002 accorded Stage-II FC for 507.31 Ha for forest land. **For Forest Land of 118.72Ha.** · The application for obtaining Forest clearance for additional 118.72 Ha. of forest land have been submitted on the Parivesh Portal vide Proposal No. FP/MH/HYD/IRRIG/537001/2025 dated 09/05/2025 · The Deputy Superintendent of Land Records, Yawal, has scheduled the boundary demarcation survey on 10/12/2025 and 11/12/2025. · At present boundary demarcation process is in progress.
Additional detail (If any)	· MoEF, GoI vide letter dated 19/04/2010 accorded Environmental Clearance (EC) to the Bodwad Parisar Sinchan Yojana with validity up to April 2020.

	· MoEF&CC, GoI vide letter dated 23/06/2020 accorded extension to the validity of EC up to 18/04/2023 · As per MoEF&CC Notification S.O. 221(E) dated 18/01/2021, the period from 01/04/2020 to 31/03/2021 was excluded, extending the EC validity up to 18/04/2024. · Further, MoEF&CC, GoI vide letter dated 07/05/2024, extended the EC validity for an additional 2 years up to 18/04/2026.
Is FRA (2006) done for FC-I	

Particulars	**Details**
Details of consultant	Techknowgreen Solutions Limited, Pune NABET Accreditation : NABET/EIA/24-27/RA 0364; Valid up to July 05, 2027
Project Benefits	1) Irrigation benefits to a command area of 42,420 Ha. across 101 villages in the water-deficit region of Jalgaon and Buldhana districts. 2) Cropping intensity of 146% will be achieved 3) Improvement in the socio-economic development and livelihood of the inhabitants 4) Social infrastructure development as a part of local Area development Plan under CER 5) Improvement in the micro-climatic conditions of the region through greenbelt development 6) Employment opportunities during construction and operational phase of the project
Status of other statutory clearances	· Central Water Commission vide letter dated 29/03/2011 granted approval to the Bodwad Area Irrigiation Scheme. · Maharashtra Pollution Control Board granted Consent to Establish to Tapi Irrigation Development Corporation vide Consent No. BO/RO (P&P)/EIC No. NK-3698-09/CC-289 dated 28/08/2009 under the Water Act, 1974, Air Act, 1981, and Hazardous Waste Rules (1989 & amendments).
R&R details	No gaothan (village habitation) is affected,

	either fully or partially.
Additional detail (If any)	

3.2.3. Deliberations by the committee in previous meetings

N/A

3.2.4. Deliberations by the EAC in current meetings

53.2.3 The EAC during deliberations noted the following:

- The EAC deliberated on the information submitted (Form 1, PFR, kml file, etc.) and as presented in the meeting and observed that the proposal is for grant of TOR for conducting EIA study for Bodwad Parisar Sinchan Yojana (CCA of 53,025 Ha) in an area of 1315.13Ha located at Sub District Jamner, Motala, Muktainagar (Edlabad), Malkapur and Bodvad, District Jalgaon and Buldana, Maharashtra by M/s Tapi Irrigation Development Corporation, Jalgaon.

- The EAC noted that the Ministry vide letter No. J-12011/3/2009-IA.I dated 19/04/2010 accorded Environmental Clearance to the Bodwad Parisar Sinchan Yojana with validity for 10 years i.e. upto April 2020. Subsequently, extension to the validity of EC granted by MoEF&CC vide letter dated 23/06/2020 for 3 years i.e. upto 18/04/2023. The committee further noted that in view of the Ministry's Notifications dated 18.01.2021 and 12.04.2022, extension to the validity of EC granted by MoEF&CC vide letter dated 07/05/2024 for another period of two years i.e. upto 18.04.2026.

- The EAC observed that the proposed project is for Bodwad Parisar Sinchan Yojana, a lift irrigation scheme in the Tapi River Basin in Jalgaon and Buldhana districts of Maharashtra. The project involves lifting 198.54 MCM (7.01 TMC) of water during the monsoon from Hatnur Dam on the Purna River and storing it in two stages Junone Reservoir (120.78 MCM) and Jamthi Reservoir (42.91 MCM). The Committee noted that the scheme aims to utilize 197.574 MCM of water to irrigate an ICA of 42,420 ha and a CCA of 53,025 ha, benefiting 101 villages across Bodwad, Jamner, Muktainagar (Jalgaon) and Malkapur, Motala (Buldhana). The project is a joint initiative of Tapi Irrigation Development Corporation (63% ICA) and Vidarbha Irrigation Development Corporation (37% ICA), reflecting coordinated basin-level development.

- The committee noted that Bodwad Parisar Sinchan Yojana is being implemented in two Stages i.e. Stage I and Stage II with a total irrigation potential of 42,420 Ha.

· The EAC observed that the work pertaining to Bodwad Parisar Sinchan Yojana was started in May 2017 and is currently under progress. As it is informed by the PP during the meeting, of the total project cost of Rs. 3,76,360.49 Lakhs, a consolidated amount of Rs. 2,31,800 Lakhs have been incurred towards construction of the components of Stage-I Bodwad Parisar Sinchan Yojana as on 31st March, 2026. Therefore, the percentage of the physical construction status of the project as estimated based on the cost incurred is deduced to be 61.59%. No construction work of Stage-II has been started, only survey and conceptual planning for Jamthi Dam have been completed.

· The EAC noted that the land requirement for Stage I of the project i.e. the Junone Dam and its associated components require a total land area of 647.38 hectares, of which 527.26 hectares has already been acquired, while 120.12 hectares remains under acquisition. The Government land requirement of 5.25 hectares has been fully acquired. In the case of

private land, 16.10 hectares is required, out of which 14.70 hectares has been acquired and the remaining 1.40 hectares is under process, including approvals and joint measurement for certain components. For forest land, 626.03 hectares is required, of which 507.31 hectares has been acquired, and the balance 118.72 hectares is under diversion process with the Forest Department. The application for obtaining Forest clearance for additional 118.72 Ha. of forest land have been submitted on the Parivesh Portal vide Proposal No. FP/MH/HYD/IRRIG/537001/2025 dated 09/05/2025. At present, the boundary demarcation process is in progress.

- For Stage-II of the project i.e. the Jamthi Dam, a total of 667.75 hectares of land, comprising 626.80 hectares of private land and 40.95 hectares of Government land is required. No land has been acquired so far, and the entire area remains to be acquired in accordance with the RFCTLARR Act, 2013 and Maharashtra Rules, 2013. No forest land is involved under this project component. Under this scheme, no gaothan (village habitation) is affected, either fully or partially.
- It was further noted that there are No national parks, wildlife sanctuaries, Biosphere Reserves, Tiger/Elephant Reserves, Wildlife Corridors etc. within 10 km distance from the project site. The proposed project has obtained following approvals:
- The EAC noted that the MoEF&CC Notification S.O. 1247(E), dated the 18th March, 2021 inter-alia states that "*....the projects where construction and commissioning of proposed activities have not been completed within the validity period of the Environmental Clearance (EC) and a fresh application for EC has been submitted due to expiry of the said period of the EC, the concerned Expert Appraisal Committee or State Level Expert Committee, as the case may be, may exempt the requirement of public hearing subject to the condition that the project has been implemented not less than fifty percentage in its physical form or construction.....*" .
- The EAC observed that the overall construction of the project is 61.59%, therefore, the EAC opined that the fresh Public Hearing may be exempted as per provisions of the above mention notification, however, general public may be consulted by inviting their comments through SPCB.

53.2.4 The EAC based on the information submitted and as presented during the meeting, recommended the proposal for grant of Standard ToR issued by the Ministry for conducting EIA/EMP study with Public Consultation (without Public hearing) for Bodwad Parisar Sinchan Yojana (CCA of 53,025 Ha) in an area of 1315.13Ha located at Sub District Jamner, Motala, Muktainagar (Edlabad), Malkapur and Bodvad, District Jalgaon and Buldana, Maharashtra by M/s Tapi Irrigation Development Corporation, Jalgaon, under the provisions of EIA Notification, 2006, as amended along with the following additional/specific ToR:

3.2.5. Recommendation of EAC

Recommended

3.2.6. Details of Terms of Reference

3.2.6.1. Specific

Miscellaneous:	
1.	PP shall obtain clearance from the inter-State aspect from the designated authorities as per the procedure.

2.	PP shall provide details of acquisition of land for the proposed project as per OM no. 22-76/2014-IA.III dated 07.10.2014.
3.	Both capital and recurring expenditure under EMP shall be submitted.
4.	The photograph should bear the date, time, latitude & longitude of the monitoring station/sampling location. In addition to this PP should submit the original test reports and certificates of the labs which will analyse the samples.
5.	Arial view video of project site shall be recorded and to be submitted.
Muck Management:	
1.	Details of quantity of muck generation component wise and disposal site along with transportation plan and its monitoring to be provided.
2.	Details of Muck Management plan prepared along with estimated cost incorporated in EIA/EMP report.
3.	Techno-economic viability of the project must be recommended from CWC.
Socio-economic Study:	
1.	Public Health Delivery Plan including the provisions of drinking water supply for local population shall be in the EIA/EMP Report. Status of the existing medical facilities in the project area shall be discussed. Possibilities of strengthening of existing medical facilities, construction of new medical infrastructure etc. will be explored after assessing the need of the labour force and local population.
2.	Declaration by the Project Proponent by way of affidavit that "No" Inter-state issue/ policy issue is involved with any State in the project.
3.	Issues raised during earlier Public hearing and compliance of the same shall be submitted in the EIA/ EMP report in the relevant chapter along with comments received from general public during public consultation to be done.
4.	Statement on the commitments (activity-wise) made during public hearing to facilitate the discussion on the CER in compliance of the Ministry's OM F. No. 22- 65/2017- IA.III dated 30th September, 2020 shall be submitted.
5.	Tentative no. of project affected families shall be identified and accordingly appropriate Rehabilitation & Resettlement plan shall be prepared.
6.	Details of settlement in 10 km area shall be submitted.
Environmental Management and Biodiversity Conservation:	
1.	PP shall obtain certified compliance report from Regional office, MoEF&CC. The report shall specifically verify the physical construction status (in %) of the project, including extent of works completed, ongoing activities, and compliance with stipulated Environmental Clearance conditions.

2.	An affidavit shall be submitted by the PP stating that construction activities of the project were carried out only up to the validity period of the EC dated 19.04.2010, and that no construction or related works have been undertaken thereafter.
3.	A study shall be carried out on impact of project activity on the aquatic and terrestrial ecosystem, within project area classifying the impact zones (highly impact/low impact zone) based on seasonal variations and covering the aspects related to impacts on aquatic ecosystem/ primary productivity due to quantity of water to be lifted and thermal stratification. Accordingly, Environment Management Plan shall be prepared.
4.	A detailed wildlife conservation plan for Schedule –I species along with mitigation measures for minimizing the human–animal conflict, duly approved by the Chief Wildlife Warden, be submitted.
5.	Sampling locations be located to cover villages situated near the reservoir and around boundary of forest area for collection of baseline data and data to be incorporated in EIA/EMP report.
6.	Source of construction material and its distance from the project site along with detailed transportation plan for construction material be elaborated in the EIA/EMP report. A detailed reclamation/ restoration plan of quarrying site/sites be incorporated in the EIA/EMP report.
7.	In case any wildlife corridor is located within 10 km radius of the project site a detailed study shall be conducted to assess the impact of project on safe movement of wild animals.
8.	Reservoir/ River banks protection plan all along the submergence need to be prepared and incorporated in EIA/ EMP.
9.	Muck disposal site and other components such as Township, site office, Stacking area and batching plant shall be located outside the forest area.
10.	PP shall prepare detailed plan for Plantation of saplings under the tree plantation campaign "Ek Ped Ma Ke Naam.

3.2.6.2. Standard

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

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

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

	Once a listing of possible r.e.t. species form the said area is developed, species specific methodologies should be adopted to ascertain their presence in the study area which would be far more conclusive as compared to the conventional sampling. If the need be, modern methods like camera trapping can be resorted to, particularly for areas in the eastern Himalayas and for secretive/nocturnal species. A detailed listing of the literature referred to, for developing lists of r.e.t. species should be provided in the EIA reports.
4.	The R.E.T. species referred to in this point should include species listed in Schedule I and II of Wildlife (Protection) Act, 1972 and those listed in the red data books (BSI, ZSI and IUCN).
Components of the EIA Study: Various aspects to be studied and provided in the EIA/EMP report are as f ollows:	
1.	null
2.	null
3.	null
4.	Physical geography, Topography, Regional Geological aspects and structure of the Catchment.
5.	Tectonics, seismicity and history of past earthquakes in the area. A site specific study of the earthquake parameters will be done. The results of the site specific earthquake design shall be sent for approval of the NCSDP (National Committee of Seismic Design Parameters, Central water Commission, New Delhi for large dams.
6.	Landslide zone or area prone to landslide existing in the study area should be examined.
7.	Presence of important economic mineral deposit, if any.
8.	Justification for location & execution of the project in relation to structural components (dam /barrage height).
9.	Impact of project on geological environment.
10.	null
11.	Meteorology (viz. Temperature, Relative humidity, wind speed/direction etc.) to be collected from nearest IMD station.
12.	Ambient Air Quality with parameters viz. Suspended Particulate Matter (SPM), Respirable Suspended Particulate Matter (RSPM) i.e. suspended particulate materials < 10 microns, Sulphur dioxide (SO2) and Oxides of Nitrogen (NOX) in the study area at 5-6 Locations.
13.	Existing Noise Levels and traffic density in the study area at 5-6 Locations.
14.	null
15.	Soil classification, physical parameters (viz., texture, Porosity, Bulk Density and water holding capacity) and chemical parameters (viz. pH, electrical conductivity, magnesium, calcium, total alkalinity, chlorides,

	sodium, potassium, organic carbon, available potassium, available phosphorus, SAR, nitrogen and salinity, etc.) at @ one sample/ha of command area.
16.	null
17.	Generation of thematic maps viz, slope map, drainage map, soil map, land use and land cover map, etc. Based on these, thematic maps, an erosion intensity map should be prepared.
18.	New configuration map to be given in the EIA Report
19.	null
20.	History of the ground water table fluctuation in the study area.
21.	Water Quality for both surface water and ground water for [i] Physical parameters (pH, Temperature, Electrical Conductivity, TSS); [ii] Chemical parameters (Alkalinity, Hardness, BOD, COD, NO3, PO4, Cl, So4, Na, K, Ca, Mg, Silica, Oil & grease, phenolic compounds, residual sodium carbonate);[iii] Bacteriological parameter (MPN, Total coliform); and [iv] Heavy Metals (Pb, As, Hg, Cd, Cr6,Total Cr, Cu, Zn, Fe) at minimum10 Locations, however, the sampling numbers should be increased depending on the command area.
22.	Delineation of sub and micro watersheds, their locations and extent based on the Soil and Land Use Survey of India (SLUSOI), Department of Agriculture, Government of India. Erosion levels in each micro-watershed and prioritization of micro-watershed through Silt Yield Index (SYI) method of SLUSOI.
23.	Hydro-Meteorology of the project viz. precipitation (snowfall, rainfall), temperature, relative humidity, etc. Hydro-meteorological studies in the catchment area should be established along-with real time telemetry and data acquisition system for inflows monitoring.
24.	Run off, discharge, water availability for the project, sedimentation rate, etc.
25.	Basin characteristics
26.	Catastrophic events like cloud bursts and flash floods, if any, should be documented.
27.	For estimation of Sedimentation Rate, direct sampling of river flow is to be done during the EIA study. The study should be conducted for minimum one year. Actual silt flow rate to be expressed in ha-m km2 year-1.
28.	Set up a G&D monitoring station and a few rain gauge stations in the catchment area for collecting data during the investigation.
29.	Flow series, 10 daily with 90%, 75% and 50% dependable years discharges.
30.	Environmental flow release should be 20% of the average of the 4 lean months of 90% dependable year during the lean season and 30% of Monsoon flow during monsoon season. For remaining months, the

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

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

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

17.	River bank and their stability
18.	Impact due to submergence
19.	Impact on forests, flora, fauna including wildlife, migratory avi-fauna, rare and endangered species, medicinal plants etc.
20.	Pressure on existing natural resources
21.	Deforestation and disturbance to wildlife, habitat fragmentation and wild animal's migratory corridors
22.	Compensatory afforestation-Identification of suitable native tree species for compensatory afforestation & green belt.
23.	Impact on fish migration and habitat degradation due to decreased flow of water
24.	Impact on breeding and nesting grounds of animal
25.	Impact on local community including demographic profile.
26.	Impact on socio-economic status.
27.	Impact on economic status.
28.	Impact on human health due to water / vector borne disease.
29.	Impact on increases traffic.
30.	Impact on Holy Places and Tourism.
31.	Impacts of blasting activity during project construction which generally destabilize the land mass and lead to landslides, damage to properties and drying up of natural springs and cause noise pollution, will be studied. Proper record shall be maintained of the base line information in the post project period.
32.	Positive as well as negative impacts likely to be accrued due to the project are to be listed.
Environment Impact Analysis	
1.	Environmental Impact Analysis due to the project on the above mentioned components should be carried out for construction and operation phases using qualitative or quantitative methods.

Environmental Management Plan	
1.	Environmental Management Plan aimed at minimizing the negative impacts of the project should be given in detail. The mitigation measures are to be presented for all the likely adverse impacts on the environment. The following suggestive mitigating plans should be included
2.	Biodiversity and Wild Life Conservation & Management Plan for conservation and preservation of endemic, rare and endangered species of flora and fauna to be prepared in consultation with State Forest Department.
3.	Compensatory Afforestation in lieu of the forest land required for the project needs to be proposed.Choice of plants should be made in consultation with State Forest Department including native and RET species, if any.
4.	Fisheries Conservation & Management Plan-Fish fauna inhabiting the affected stretch of river, a specific fisheries management plan should be prepared for river and reservoir.
5.	Plan for Green Belt Development along the periphery of reservoir, colonies, approach road, canals etc. to be prepared in consultation with the State Forest Department. Local plant species suitable for greenbelt development should be selected.
6.	Environmental Monitoring Programme with physical & financial details covering all the aspects of EMP. A summary of cost estimate for all the plans, cost for implementing all Environmental Management Plans including the cost for implementing environmental monitoring programme should be given. Provision for an Environmental Management Cell should be made.
7.	Catchment Area Treatment (CAT) Plan should be prepared micro-watershed wise. Identification of area for treatment based upon Remote Sensing & GIS methodology and Silt Yield Index (SYI) method of SLUSOI coupled with ground survey. Areas/watersheds falling under 'very severe' and `severe' erosion categories are required to be treated. Both biological and engineering measures should be proposed in consultation with State Forest Department. Year-wise schedule of work and monetary allocation should be provided. CAT plan is to be completed prior to reservoir impoundment. Mitigations measures to check shifting cultivation in the catchment area with provision for alternative and better agricultural practices should be include.
8.	Study of Design Earthquake Parameters: A site specific study of earthquake parameters should be done. The results of the site specific earth quake design parameters should be approval by National Committee of Seismic Design Parameters, Central Water Commission (NCSDP), New Delhi.
9.	Dam Break Analysis and Disaster Management Plan: The outputs of Dam Break Model should be illustrated with appropriate graphs and maps clearly bringing out the impact of Dam break scenario. Provision for early warning systems should be provided.
10.	Reservoir Rim Treatment Plan for stabilization of land slide/land slip zones if any, around the reservoir periphery to be prepared. Suitable engineering and biological measures for treatment of the identified slip zones to be provided with physical and financial schedule.
11.	Muck Disposal Plan- suitable sites for dumping of excavated material should be identified in consultation with the State Pollution Control Board and Forest Department. All Muck disposal sites should be minimum 30 m away from the HFL of river. Plan for rehabilitation of muck disposal sites should also be given. The L- section/ cross section of muck disposal sites and approach roads to be given. Financial out lay for this may be given separately. Deatailed muck transportation plan delinating the path ways, number of trucks, quantity of muck to be transportated along with monitoring mechanism using latest technology, shall be prepared.

12.	Plan for Restoration of quarry sites and landscaping of colony areas, working areas, roads, etc.
13.	Command Area Development (CAD) Plan giving details of implementation schedule with a sample CAD plan.
14.	In the EMP, also include a sample CAD plan for a distributary outlet command. Such a plan is to show the alignment of irrigation and drainage channels. The components of the OFD works to be undertaken may be clearly mentioned along with a time schedule for their completion vis-à-vis the progress of irrigation development.
15.	Mitigating measures for impacts due to Blasting on the structures in the vicinity.
16.	Resettlement and Rehabilitation (R&R) Plan need to be prepared with due consultation with Project Affected Families (PAFs). The provision of the d R&R plan should be according to the National Resettlement and Rehabilitation Policy (NRRP-2007) as well as State Resettlement and Rehabilitation Policy. Detailed budgetary estimates are to be provided. Resettlements sites should be identified.
17.	Public Health Delivery Plan including the provisions for drinking water facility for the local community.
18.	Local Area Development Plan to be formulated in consultation with the Revenue Officials and Village Panchayats. Local skill development schemes should be given. Details of various activities to be undertaken along with its financial out lay should be provided.
19.	Labour Management Plan for their Health and Safety.
20.	Sanitation and Solid Waste Management Plan for domestic waste from colonies and labour camps etc.
21.	Plan for Land Restoration and Landscaping of project sites.
22.	Energy Conservation Measures.
23.	Environmental safeguards during construction activities including Road Construction.
24.	Ground Water Management Plan.
25.	Water and Air Quality & Noise Management Plans to be implemented during construction and post-construction periods.

3.3. Agenda Item No 3:

3.3.1. Details of the proposal

Amba Pumped Storage Project, 1500 MW at Village: Gevhande Apati, Taluka: Mawal, District: Pune, and Village: Bheliv, Taluka: Sudhagad, District: Raigad, Maharashtra by **NTPC LIMITED** located at **PUNE,MAHA**

RASHTRA			
Proposal For		Fresh ToR	
Proposal No	**File No**	**Submission Date**	**Activity Sub-Activity (Schedule Item)**
IA/MH/RIV/575297/2026	J-12011/18/2026-IA.I(R)	10/04/2026	River Valley/Irrigation projects Standalone Pump Storage Projects (1(c))

3.3.2. Project Salient Features

53.3.1 The proposal is for grant of Terms of Reference (ToR) to the project Amba Open Loop Pumped Storage Project (1500 MW) in an area of 272.21 Ha located at Sub District Mawal and Sudhagad, District Pune and Raigad, Maharashtra by M/s NTPC Limited.

52.3.2 The Project Proponent and the accredited Consultant M/s WAPCOS Ltd., made a detailed presentation on the salient features of the project and informed that:

i. The proposed project is the Amba Pumped Storage Project, with an installed capacity of 1500 MW, and is located in the Pune/Raigad district of Maharashtra. Amba Pumped Storage Project (6X250 MW) is proposed as an open loop pumped storage scheme.

ii. The proposed Upper Reservoir, located on Seasonal Nala, which drains into Pawana/Pauna lake on the Pawana/Pauna River, which is a tributary of the Bhima River, has a live storage of 6.13 MCM. The Lower Reservoir is located on seasonal Sayali Nala, which Merges into Uttara Nadi, which is a tributary of Amba River, with a live storage capacity of 6.995 MCM.

iii. The two reservoirs will be interconnected by a water conductor system designed to utilize an available gross head of 617.33 m. An underground powerhouse will be constructed to house six fixed-speed, reversible Francis turbine-generator units, along with associated equipment such as generator-motor assemblies, transformers, and other auxiliaries. The operational strategy for the project involves daily peaking generation for 5 hours, 57.17 minutes (average) to meet peak demand. Pumping operations will be carried out using offpeak grid power and surplus Variable Renewable Energy (VRE).

iv. The project envisages the installation of six (6) reversible pump-turbine units, each of 250 MW capacity, in an underground powerhouse, resulting in a total installed capacity of 1500 MW (6 × 250 MW). Power generation will be achieved by utilizing an average gross head of 617.33 m through a water conductor system of approximately 4655 m in length.

v. The geographical co-ordinate of the project are 18°42'11"N, 73°24'30.22"E (Left Bank) & 18°42'4.64"N,73°24'18.49"E (Right Bank) for Upper Reservoir and 18°40’43.56”N & 73°21’48.71” E (Left bank) & 18°41’6.53” N & 73°21’39.85” E (Right bank) for Lower Reservoir

vi. Amba Pumped Storage Project (6 x 250 MW), envisages construction of: Upper Dam with Spillway, Lower Dam with Spillway, Power intake, Headrace tunnel, Up Stream Surge Shaft, Pressure shaft, MAT and construction Adits, Underground Powerhouse and transformer cavern, Draft Tube and Tailrace tunnel, Down Stream Surge Shaft, Tailrace Tunnel outfall structures

vii. **Land requirement:**

Nature of Land involved	Area in Ha

The proposed project is located in Mawal Taluka in Pune District and Sudhagad Taluka in district Raigad. As per Census 2011, Mawal taluka in Pune district has a total population of approximately 3.0 lakh, comprising about 1.58 lakh males and 1.42 lakh females. Sudhagad taluka in Raigad district has a population of around 1.1 lakh, including approximately 56000 males and 54000 females.

ix. **Water requirement:**

x. **Project Cost:** The estimated project cost is ₹ **7294.88 Crores** at Feb 2026 price level. The preliminary cost estimate of the project has been prepared as per guidelines of CEA / CWC. The Abstract Summary of the cost estimates is given below:

Description	**Project Cost (Price Level Feb 2026)**
Cost of Civil Works including H&M	₹ 3593.00 Cr
Cost of E&M Works	₹ 2850.00 Cr
IDC	₹ 851.88 Cr
Total Cost of the Project (in INR Crore)	**₹ 7294.88 Cr**

xi. **Project Benefit:** The scheme would afford an annual peaking period energy generation of 3097.12 GWh annually, considering the project operation for one cycle for 5 hours 57.17 minutes peaking per day calculated with 95% capacity availability. Employment shall be generated during project construction and operation phases.

xii. **Environmental Sensitive Area:** There are no National parks, wildlife sanctuaries, Biosphere Reserves, Tiger/ Elephant Reserves, and Wildlife Corridors etc. within 10 km distance from the project site. River/ water body is flowing at a distance of km in upstream direction. However, the project components are located within Western Ghat.

xiii. **MoU / any other clearance/ permission signed with State government:** NTPC Limited signed a Memorandum of Understanding (MoU) with the Government of Maharashtra in 2024 for the development of two pumped storage projects, namely Amba PSP.

xiv. **Alternative Studies:** A total of three alternative layouts with the optimised project components have been studied for the upper and lower reservoirs.

Alternative-I:

- Ø In Alternative-1, lower dam is proposed as a Concrete Gravity Dam with a height of about 41.0 m and a crest length of 834.3 m. This dam is located across a seasonal stream known as Sayali Nala, which drains into Uttara Nadi, a tributary of the Amba River
- Ø The upper dam is located approximately 5.2 km in the north-easterly direction from the proposed lower reservoir, near a cliff section. It is proposed as a Concrete Gravity Dam with a height of about 101.0 m and a crest length of 427 m. It is situated on a seasonal nala, which is a tributary of the main stream of the Pawana (Pauna) River that ultimately drains into the Pawana Reservoir
- Ø Available Gross head 617.33 m
- Ø Required Live storage is 6.13 MCM
- Ø L/H ratio is 7.52 m

- Proposed Installed capacity 1500MW

Alternative-II

- In Alternative-2, lower dam is proposed as a Concrete Gravity Dam with a height of about 42.0 m and a crest length of 855 m. This dam is located across a seasonal stream known as Sayali Nala, which drains into Uttara Nadi, a tributary of the Amba River
- The upper dam is located approximately 4.2 km in the easterly direction from the proposed lower reservoir, near a cliff section. The upper dam is proposed as a Concrete Gravity Dam with a height of about 53.0 m and a crest length of 500.00 m. It is situated on the main stream of the Pawana (Pauna) River, which ultimately drains into the Pawana Reservoir
- Available Gross head 554.50 m
- Required Live storage is 7.50 MCM
- L/H ratio is 4.63 m
- Proposed Installed capacity 1500MW

Alternative-III

- In Alternative-3, lower dam is proposed as a Concrete Gravity Dam with a height of about 40.50 m and a crest length of 821 m. This dam is located across a seasonal stream known as Sayali Nala, which drains into Uttara Nadi, a tributary of the Amba River
- The upper dam is located approximately 4.0 km in the easterly direction from the proposed lower reservoir. The upper dam is proposed as a peripheral rockfill embankment dam with a height of about 20.0 m and a crest length of approximately 2,770.00 m. The reservoir is proposed to be developed on a table top hill near Atvan.
- Available Gross head 668.0 m
- Required Live storage is 5.55 MCM
- L/H ratio is 5.49 m
- Proposed Installed capacity 1500MW

Comparative Table : Layout Alternatives

Description	**Alt-I**	**Alt-II**	**Alt-III**
Lower Reservoir			
Reservoir Type	New	New	New
Gross storage (MCM)	7.86	22.77	7.22
Proposed Live Storage (MCM)	6.995	6.70	6.35
Length of dam (m)	834.3	855	821

Height of dam (m)	41	42	40.50
Upper Reservoir			
Reservoir Type	New	New	New
Gross storage (MCM)	7.66	8.37	5.55
Proposed Live Storage (MCM)	6.13	7.5	5.55
Length of dam (m)	427	500	2770
Height of dam (m)	101	53	20
Gross Head (m)	617.33	554.50	668.00
Tentative WCS Length (m)	4640	2570	3670
L/H Ratio	7.52	4.63	5.49
Proposed Installed Capacity (MW)	1500	1500	1500
Total Hard Cost (in crore)	6443.00	6453.06	6750.11
Tentative Tariff @3 Rs pumping cost	8.87	9.03	8.99
Forest (ha.)	112.56	151.93	112.32
Non Forest (ha.)	159.65	247.44	251.17
Total (ha.)	272.21	399.37	363.49
Rank	I	III	II

- Ø Based on the analysis, all proposed alternatives demonstrate comparable outcomes in terms of tariff.
- Ø Alternatives–I and II offer certain advantages, particularly in terms of higher available hydraulic head. However, Alternative–III involves extensive hill cutting and a substantial quantity of muck generation, requiring disposal within forest areas, which may lead to significant environmental challenges.
- Ø Alternative–II entails the highest requirement of forest land diversion (approximately 152 ha), which may also pose considerable regulatory and environmental constraints.
- Ø In comparison, Alternative–I requires one of the least quantum of forest land. It also offers a favourable balance between available head, land requirement, and overall constructability of project components

xv. **Details of Solid waste/ Hazardous waste generation/ Muck and its management: Solid** Waste – 273 kg/day (Construction Phase); Management Plans to be prepared as part of

EMP of EIA study after approval of ToR

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

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

· **Project details**

Name of the Proposal	Amba Pumped Storage Project (6X250 MW)
Location (Including coordinates)	Village: Gevhande Apati, Taluka: Mawal, District: Pune, and Village: Bheliv, Taluka: Sudhagad, District: Raigad, Maharashtra. **UPPER RESERVOIR** 18°42'11"N, 73°24'30.22"E (Left Bank) & 18° 42'4.64"N, 73°24'18.49"E (Right Bank) **LOWER RESERVOIR** 18°40'43.56"N & 73°21'48.71" E (Left bank) & 18°41'6.53" N & 73°21'39.85" E (Right bank)
Inter- state issue involved	Nil
Seismic zone	IV
Category of the project	Category A
Provisions	--
Capacity / Cultural command area (CCA)	1500 MW (6 x 250 MW)
Attracts the General Conditions (Yes/No)	No
Additional information (if any)	--
Powerhouse Installed Capacity	1500 MW (6 x 250 MW)
Generation of Electricity Annually	3097.12 GWh
No. of Units	6 x 250 MW
Additional information (if any)	--
Cost of project	Rs. 7294.88 Crores (Incl. IDC)
Total area of Project	272.21 Hectares

Height of Dam from River Bed (EL)	Lower dam – 41m
Length of Tunnel/Channel	8425 m
Details of Submergence area	(Forest land: 28.42 ha. ; Non forest land: 69.80 ha.)
Types of Waste and quantity of generation du ring construction/ Operation	Solid Waste – 273 kg/day (Construction Phase)
E-Flows for the Project	As Applicable
Is Projects earlier studies in Cumulative Imp act assessment & Carrying Capacity studies (CIA&CC) for River in which project located. If yes, then a) E-flow with TOR/ Recommendation by EA C as per CIA&CC study of River Basin. b) If not the E-Flows maintain criteria for su staining river ecosystem.	No
No. of trees/ saplings proposed in view of 'Ek Ped Maa Ke Naam' campaign	Shall be proposed during EIA study
No. of proposed disposal area/(type of land- Forest/Pvt. land)	2 no of proposed disposal area / Non Fores t Land (34.40 ha.)
Muck Management Plan	To be prepared as part of EIA Studies
Monitoring mechanism for Muck Disposal	To be prepared as part of EIA Studies
Private land /Non Forest Land	159.65 ha
Government land	--
Forest Land	112.56 ha
Total Land	272.21 ha
Submergence area/Reservoir area	(Forest land: 28.42 ha. ; Non forest land: 6

	9.80 ha.)
Additional information (if any)	- -

Forest Land/ Protected Area/ Environmental Sensitivity Zone	Yes/No	**Details of Certificate/ letter/Remarks**
Reserve Forest/Protected Forest Land	Yes	Sudhagad & Wadgaon Reserved Forest
National Park	No	
Wildlife Sanctuary	No	

· **Court case detail**: Nil

· **Previous EC compliance and necessary approvals**

Particulars	**Letter no. and date**
Certified EC compliance report (if applicable)	NA
Status of Stage-I FC	Yet to be submitted
Additional detail (If any)	-
Is FRA (2006) done for FC-I	No

Particulars	**Details**
Details of consultant	WAPCOS Limited
Project Benefits	· The primary objective of the proposed Amba PSP (6X250 MW) is to enhance the peak power generation · Increased power availability will support agriculture, industries, and rural electrification, thereby improving the quality of life. · Construction of roads, bridges, and buildings during the project will improve regional connectivity and benefit local communities. · A healthcare unit will be established near the dam site. Improved road access will also enhance connectivity to medical facilities. · Construction phase will generate direct and indirect employment, stimulate local businesses, and enhance tra

	de opportunities. · A Local Area Development Plan (0.5% of project cost) will further support education, healthcare, and infrastru cture development in project-affect ed and adjoining villages. · Employment during project constructi on and operation phases
Status of other statutory clearances	Yet to be submitted
R&R details	To be prepared as part of EIA Studies
Additional detail (If any)	-

3.3.3. Deliberations by the committee in previous meetings

N/A

3.3.4. Deliberations by the EAC in current meetings

53.3.3 The EAC during deliberations noted the following:

· The Expert Appraisal Committee (EAC) deliberated on the information submitted (Form 1, PFR, kml file, etc.) and as presented in the meeting and observed that the proposal is for grant of TOR for conducting EIA/EMP and Public hearing for Amba Open Loop Pumped Storage Project (1500 MW) in an area of 272.21 Ha located at Sub District Mawal and Sudhagad, District Pune and Raigad, Maharashtra by M/s NTPC Limited.

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

· The EAC observed that the Upper Reservoir, located on Seasonal Nala, which drains into Pawana/Pauna lake on the Pawana/Pauna River, which is a tributary of the Bhima River and the Lower Reservoir is located on seasonal Sayali Nala, which Merges into Uttara Nadi, which is a tributary of Amba River, since both of the reservoirs are located on Seasonal Nala therefore, the project is termed as Open Loop project.

· The EAC noted that the total land requirement for the proposed project is estimated to be approximately 272.21 ha, of which about 112.56 ha falls within forest land, while the remaining 159.65 ha is non forest land (private/revenue land). Diversion of forest land for non-forest purpose will be involved for construction of project components. However, it was observed that the application for Stage-I Forest Clearance (FC) has not yet been submitted, which necessitates further action from the Project Proponent. The One-time water requirement for both proposed upper and lower reservoirs for PSP under consideration is only 9.683 MCM, with 0.86 MCM as the annual requirement for evaporation during dry season and 0.292 MCM for one-time filling/surcharging water requirement for WCS. It is proposed that the water of the river Sayali will be used to fill up the Upper & Lower reservoirs.

· The EAC during the meeting observed that there is no Environmental sensitive area within 10km boundary of the proposed project, however, the EAC noted that all the project components are located within the proposed Western Ghats ESA, Maharashtra as per MOEF&CC draft notification S.O.30609(E) dated 31.07.2024. Additionally, the EAC noted that several projects are already proposed in the vicinity of the project area; therefore, the Committee advised PP to undertake a combined study of all projects to assess the overall environmental impacts.

· The EAC observed that Memorandum of Understanding was signed between M/s NTPC limited and Department of Water Resources, Govt. of Maharashtra on 03.09.2024, for establishment of Amba Pumped Storage project with a capacity of 800 MW. However, the present proposal submitted by the PP envisages an enhanced capacity of 1500 MW. In view of the substantial increase in the proposed capacity, the Committee opined that an amendment/revision of the existing MoU shall be required to align it with the revised project configuration.

53.3.4 The EAC based on the information submitted and as presented during the meeting, recommended the proposal for grant of Specific ToR issued by the Ministry for Open Loop Pumped Storage Projects vide OM dated 14.08.2023 for conducting EIA study for proposed construction of the project for Amba Open Loop Pumped Storage Project (1500 MW) in an area of 272.21 Ha located at Sub District Mawal and Sudhagad, District Pune and Raigad, Maharashtra by M/s NTPC Limited, under the provisions of EIA Notification, 2006, as amended along with the following additional/specific ToR:

3.3.5. Recommendation of EAC

Recommended

3.3.6. Details of Terms of Reference

3.3.6.1. Specific

Miscellaneous:	
1.	Both capital and recurring expenditure under EMP shall be submitted.
2.	PP shall follow all the terms and conditions mentioned in draft notification issued by MOEF&CC vide S.O.3060(E) dated 31.07.2024 of Western Ghats ESA for preparation of EIA/EMP report.
3.	Pre-DPR Chapters viz., Hydrology, Layout Map and Power Potential Studies duly appraised by CWC/CEA shall be submitted.
4.	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.
5.	Drone video of project site shall be recorded and to be submitted.
6.	Detailed plan to restore wider roads and convert them into narrow up to 10m after construction of the project.

7.	Specific Terms of Reference (ToRs) issued by the Ministry vide Office Memorandum No. F. No. IA3-22/33/2022-IA.III dated 14.08.2023 for Pumped storage projects shall be used for preparation of EIA/ EMP reports.
8.	As per Ministry's OM dated 1st August, 2013, PP shall submit application to obtain prior approval of Central Government under the Forest Conservation Act, 1980 for diversion of forest land required for such projects will be submitted as soon as the actual extent of forest land required for the project is known to the project proponent, and in any case, within 6 months of issuance of ToR. However, no proposal will be put up before EAC without submission of application for forest clearance, wherever applicable.
9.	PP shall provide details of acquisition of land for the proposed project as per OM no. 22-76/2014-IA.III dated 07.10.2014.
Disaster Management:	
1.	Impact of Project activities (specially blasting and drilling) on the aquatic and terrestrial ecosystem, within study area to be studied and be incorporated in EIA/EMP report.
2.	The muck dumping sites shall be located with a distance of 100 mts from HFL. The PP shall submit the detailed action plan for transportation of muck along with monitoring mechanism of movement of muck carrying trucks.
Muck Management:	
1.	Details of quantity of muck generation component wise, types of muck (Excavation in tunnels, pressure shaft and powerhouse etc.) and disposal site/ transportation to be provided.
2.	Details of 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.
Socio-economic Study:	
1.	Declaration by the project proponent by way of affidavit that "No" Inter-state issue/ policy issue is involved with any State in the project.
2.	All the tasks including conducting public hearing shall be done as per the provisions of EIA Notification, 2006 and as amended from time to time. A comparative chart of issues raised by General Public during Public Hearing and commitments made by the Project Proponent will be prepared and submitted in the relevant chapter of EIA/EMP report.

3.	The EIA/EMP shall include a detailed socio-economic assessment of the tribal population in the project-affected area based on primary data and community consultations. A Tribal Development Plan, prepared in consultation with the District Administration and Tribal Welfare Department, shall be submitted along with the EIA report.
4.	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 as amended, for the project land to be acquired.
5.	Land acquired for the project shall be suitably compensated in accordance with the law of the land with the prevailing guidelines. Private land (if any) shall be acquired as per provisions of Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013. Budget earmarked for R&R, CSR shall not be included in the cost of EMP.
Environmental Management and Biodiversity Conservation:	
1.	Impact of construction activities on natural streams/springs/aquifers shall be studied and accordingly conservation action plan shall be prepared in consultation with expert government research institute after detailed mapping of the study area.
2.	PP shall obtain amendment/revision of the existing MoU to reflect the revised project capacity of 1500 MW.
3.	A detailed action plan for large scale plantation of native species of plant sapling within 10 km radius of the project shall be prepared in consultation with State Forest Department. The monitoring mechanism to ensure the survival of saplings shall be finalized in consultation with ICFRE.
4.	The PP will submit 10 years water availability data certified by the CWC/State Water Resource Department for quantity of water that is received annually by the small stream on which lower reservoir is proposed to be constructed.
5.	The PP will submit a detailed plan and monitoring mechanism for releasing the self - catchment water of small stream draining in to river along with action plan for conservation and protection of other streams/rivulets draining in to upper and lower reservoirs.
6.	Explore the possibilities for reducing the Forest land requirement. The application for obtaining Stage I FC for 112.56 ha of forest land involved in the project shall be submitted within stipulated time.
7.	Muck disposal site and other components such as Township, site office, Stacking area and batching plant shall be located outside the forest area.
8.	Certificate and certified map from Chief Wildlife Warden shall be submitted mentioning that project boundary is not falling in any Ecological Sensitive Area, Wildlife Sanctuary/Tiger/elephant corridor/Critically polluted area within 10 km of Project site.
9.	Transportation Plan for transporting construction materials shall be submitted. Separate chapter for risk assessment of such transportation through/within proposed the Wildlife Sanctuary shall be included in the EIA report, if any.

10.	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.
11.	The baseline data collection will cover the changes in biological and ecological profile of the region after monsoon with worst-case scenario study and critical mineral assessment.
12.	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.
13.	The longitudinal connectivity/Free flowing sketch be provided in the EIA/EMP report.
14.	Quantitative values of Impact modelling of environmental parameters shall be submitted for during construction and operation. Also, mitigation measures shall be submitted in terms of construction and operation phase.
15.	Conducting site-specific ecological study emphasizing on riverine ecology viz. fishes diversity, fish migration, habitat and aquatic biota due to construction PSP. Impact assessment on the fish diversity based on the hydrological alteration at the water drawing sources shall be studied.
16.	Action plan for survival or diversion of the rivulets/stream, if any, leading to join river shall be submitted.
17.	Impact zone decided prior to base line data generation and accordingly, sampling location shall be finalized. Baseline data as mentioned in Specific ToR shall be collected for preparation of EIA/ EMP report along with soil characteristics which shall be studied at minimum 10 locations. The ground water level at 10 locations shall be measured in project area in all seasons.
18.	A study shall be carried out on impact of project activity on the aquatic and terrestrial ecosystem, within project area classifying the impact zones (highly impact/low impact zone) based on seasonal variations and covering the aspects related to impacts on aquatic ecosystem/ primary productivity due to quantity of water to be lifted for power generation and thermal stratification. Accordingly, Environment Management plan shall be prepared.
19.	Reservoir/ River banks protection plan all along the submergence need to be prepared and incorporated in EIA/ EMP.
20.	Scope of watershed development in the 10 km radius of the project shall be studied in consultation with Indian Council of Agriculture Research (ICAR) Institutes/ Expert Govt. institutions and accordingly a detailed Water Shed Development Plan shall be prepared and incorporated in EIA/ EMP report.
21.	Details of mineral zone, if any, in the study area, certified by Geological Survey of India or any other concerned Government Organization shall be submitted. The project area should not come up on any critical mineral zone, the same shall to be verified by GSI/NMDC.
22.	Any archaeological sites in the vicinity of the project, if any, then it shall be certified by ASI.

23.	Combined Impact of projects proposed on carrying capacity and sustainability of the natural stream/Reservoir/ River /nala of catchment area due to tapping of water for filling reservoir shall be studied.
24.	The EAC site visit shall be conducted before considering the proposal for grant of Environmental Clearance in view of project location in Western Ghats.

3.3.6.2. Standard

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

11.	Remote Sensing studies, interpretation of satellite imagery, topographic sheets along with ground verification shall be used to develop the land use/land cover pattern of the study using overlaying mapping techniques viz. Geographic Information System (GIS), False Color Composite (FCC) generated from satellite data of project area.
12.	Land details including forests, private and other land.
13.	Demarcation of snow fed and rain fed areas for a realistic estimate of the water availability.
14.	Different riverine habitats like rapids, pools, side pools and variations in the river substratum bedrocks, rocks, boulders, sand/silt or clay etc. need to be covered under the study
Description of Environment and Baseline Data	
1.	To know the present status of environment in the area, baseline data with respect to environmental components air, water, noise, soil, land and biology & biodiversity (flora & fauna), wildlife, socioeconomic status etc. should be collected within 10 km radius of the main components of the project/site i.e. dam site and power house site. The air quality and noise are to be monitored at such locations which are environmentally & ecologically more sensitive in the study area. The baseline studies should be collected for 1 season (Preferably Monsoon season). Flora-Fauna in the catchment and command area should be documented. The study area should comprise of the following:
2.	(i) Catchment area up to the dam/barrage site.
3.	(ii) Submergence Area.
4.	(iii) Project area or the direct impact area should comprise of area within 10 km radius of the main project components like dam, canals etc.
5.	(iv) Downstream upto 10 km from the tip of the reservoir.
Details of the Methology	
1.	The methodology followed for collection of base line data along with details of number of samples and their locations in the map should be included. Study area should be demarcated properly on the appropriate scale map. Sampling sites should be depicted on map for each parameter with proper legends. For Forest Classification, Champion and Seth (1968) methodology should be followed.
Methodology for Collection of Biodiversity Data	
1.	The number of sampling locations should be adequate to get a reasonable idea of the diversity and other attributes of flora and fauna. The guiding principles should be the size of the study area (larger area should have larger number of sampling locations) and inherent diversity at the location, as known from secondary sources (e.g. eastern Himalayan and low altitude sites should have a larger number of sampling locations owing to higher diversity).
2.	The entire area should be divided in grids of 5kmX5km preferably on a GIS domain. There after 25% of the grids should be randomly selected for sampling of which half should be in the directly affected area (grids including project components such as reservoir, dam, powerhouse, tunnel, canal etc.) and the remaining in the rest of the area (areas of influence in 10 km radius form project components). At such chosen location, the size and number of sampling units (e.g. quadrates in case of flora/transects in case of fauna) must be decided by species area curves and the details of the same (graphs and cumulative

	number of species in a tabulated form) should be provided in the EIA report. Some of the grids on the edges may not be completely overlapping with the study area boundaries. However, these should be counted and considered for selecting 25% of the grids. The number of grids to be surveyed may come out as a decimal number (i.e. it has an integral and a fractional part) which should be rounded to the next whole number.
3.	The conventional sampling is likely to miss the presence of rare, endangered and threatened (r.e.t.) species since they often occur in low densities and in case of faunal species are usually secretive in behaviour. Reaching the conclusion about the absence of such species in the study area based on such methodology is misleading. It is very important to document the status of such species owing to their high conservation value. Hence likely presence of such species should be ascertained from secondary sources by a proper literature survey for the said area including referring to field guides which are now available for many taxonomic groups in India. Even literature from studies/surveys in the larger landscapes which include the study area for the concerned project must be referred to, since most species from adjoining catchments is likely to be present in the catchments in question. In fact such literature form the entire state can be referred to. Once a listing of possible r.e.t. species form the said area is developed, species specific methodologies should be adopted to ascertain their presence in the study area which would be far more conclusive as compared to the conventional sampling. If the need be, modern methods like camera trapping can be resorted to, particularly for areas in the eastern Himalayas and for secretive/nocturnal species. A detailed listing of the literature referred to, for developing lists of r.e.t. species should be provided in the EIA reports.The conventional sampling is likely to miss the presence of rare, endangered and threatened (r.e.t.) species since they often occur in low densities and in case of faunal species are usually secretive in behaviour. Reaching the conclusion about the absence of such species in the study area based on such methodology is misleading. It is very important to document the status of such species owing to their high conservation value. Hence likely presence of such species should be ascertained from secondary sources by a proper literature survey for the said area including referring to field guides which are now available for many taxonomic groups in India. Even literature from studies/surveys in the larger landscapes which include the study area for the concerned project must be referred to, since most species from adjoining catchments is likely to be present in the catchments in question. In fact such literature form the entire state can be referred to. Once a listing of possible r.e.t. species form the said area is developed, species specific methodologies should be adopted to ascertain their presence in the study area which would be far more conclusive as compared to the conventional sampling. If the need be, modern methods like camera trapping can be resorted to, particularly for areas in the eastern Himalayas and for secretive/nocturnal species. A detailed listing of the literature referred to, for developing lists of r.e.t. species should be provided in the EIA reports.
4.	The R.E.T. species referred to in this point should include species listed in Schedule I and II of Wildlife (Protection) Act, 1972 and those listed in the red data books (BSI, ZSI and IUCN).
Components of the EIA Study: Various aspects to be studied and provided in the EIA/EMP report are as f ollows:	
1.	null
2.	null
3.	Physical geography, Topography, Regional Geological aspects and structure of the Catchment.
4.	Tectonics, seismicity and history of past earthquakes in the area. A site specific study of the earthquake parameters will be done. The results of the site specific earthquake design shall be sent for approval of the NCSDP (National Committee of Seismic Design Parameters, Central water Commission, New Delhi for large dams.
5.	Landslide zone or area prone to landslide existing in the study area should be examined.

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

22.	Run off, discharge, water availability for the project, sedimentation rate, etc.
23.	Basin characteristics
24.	Catastrophic events like cloud bursts and flash floods, if any, should be documented.
25.	For estimation of Sedimentation Rate, direct sampling of river flow is to be done during the EIA study. The study should be conducted for minimum one year. Actual silt flow rate to be expressed in ha-m km2 year-1.
26.	Set up a G&D monitoring station and a few rain gauge stations in the catchment area for collecting data during the investigation.
27.	Flow series, 10 daily with 90%, 75% and 50% dependable years discharges.
28.	Information on the 10-daily flow basis for the 90 per cent dependable year the flow intercepted at the dam, the flow diverted to the power house and the spill comprising the environmental flow and additional flow towards downstream of the dam for the project may be given.
29.	The minimum environmental flow shall be 20% of the flow of four consecutive lean months of 90% dependable year, 30% of the average monsoon flow. The flow for remaining months shall be in between 20-30%, depending on the site specific requirements. A site specific study shall be carried out by an expert organization.
30.	Sedimentation data available with CWC may be used to find out the loss in storage over the years.
31.	Hydrological studies/data as approved by CWC shall be utilized in the preparation of EIA/EMP report. Actual hydrological annual yield may also be given in the report. Sedimentation data available with CWC may be used to find out the loss in storage over the years.
32.	A minimum of 1 km distance from the tip of the reservoir to the tail race tunnel should be maintained between upstream and downstream projects.
33.	Besides primary studies, review of secondary data/literature published for project area on flora & fauna including RET species shall be reported in EIA/EMP report.
34.	null
35.	Characterization of forest types (as per Champion and Seth method) in the study area and extent of each forest type as per the Forest Working Plan.
36.	Documentation of all plant species i.e. Angiosperm, Gymnosperm, Pteriodophytes, Bryophytes (all groups).
37.	General vegetation profile and floral diversity covering all groups of flora including lichens and orchids. A species wise list may be provided.

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

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

1.	The adverse impact due to the proposed project should be assessed and effective mitigation steps to abate these impacts should be described.
2.	Changes in ambient and ground level concentrations due to total emissions from point, line and area sources.
3.	Effect on soil, material, vegetation and human health.
4.	Impact of emissions from DG set used for power during the construction, if any, on air environment.
5.	Pollution due to fuel combustion in equipments and vehicles
6.	Fugitive emissions from various sources
7.	Changes in surface and ground water quality
8.	Steps to develop pisci-culture and recreational facilities
9.	Changes in hydraulic regime and downstream flow.
10.	Water pollution due to disposal of sewage
11.	Water pollution from labour colonies/ camps and washing equipment.
12.	Adverse impact on land stability, catchment of soil erosion, reservoir sedimentation and spring flow (if any) (a) due to considerable road construction / widening activity (b) interference of reservoir with the inflowing stream (c) blasting for commissioning of HRT, TRT and some other structures.
13.	Changes in land use / land cover and drainage pattern
14.	Immigration of labour population
15.	Quarrying operation and muck disposal
16.	Changes in land quality including effects of waste disposal
17.	River bank and their stability
18.	Impact due to submergence.
19.	Impact on forests, flora, fauna including wildlife, migratory avi-fauna, rare and endangered species, medicinal plants etc.
20.	Pressure on existing natural resources

21.	Deforestation and disturbance to wildlife, habitat fragmentation and wild animal's migratory corridors
22.	Compensatory afforestation-identification of suitable native tree species for compensatory afforestation and green belt.
23.	Impact on fish migration and habitat degradation due to decreased flow of water
24.	Impact on breeding and nesting grounds of animals and fish.
25.	Impact on local community including demographic profile.
26.	Impact on socio-economic status
27.	Impact on economic status.
28.	Impact on human health due to water / vector borne disease
29.	Impact on increase traffic
30.	Impact on Holy Places and Tourism
31.	Impacts of blasting activity during project construction which generally destabilize the land mass and leads to landslides, damage to properties and drying up of natural springs and cause noise population will be studies. Proper record shall be maintained of the baseline information in the post project period.
32.	Positive and negative impacts likely to be accrued due to the project are listed.
Environmental Management Plan	
1.	null
2.	Biodiversity and Wildlife Conservation and Management Plan for the conservation and preservation of rare, endangered or endemic floral/faunal species or some National Park/Sanctuary/ Biosphere Reserve or other protected area is going to get affected directly or indirectly by construction of the project, then suitable conservation measures should be prepared in consultation with the State Forest Department and with the physical and financial details. Suitable conservation techniques (in-situ/ ex-situ) will be proposed under the plan and the areas where such conservation is proposed will be marked on a project layout map.
3.	Compensatory Afforestation shall be prepared by the State Forest Department in lieu of the forest land proposed to be diverted for construction of the project as per the Forest (Conservation) Act, 1980. Choice of plants for afforestation should include native and RET species, if any. This will be a part of the forest clearance proposal.

4.	Fisheries Conservation and Management Plan - a specific fisheries management measures should be prepared for river and reservoir. If the construction of fish ladder/ fish-way etc. is not feasible then measures for reservoir fisheries will be proposed. The plan will detail out the number of hatcheries, nurseries, rearing ponds etc. proposed under the plan with proper drawings. If any migratory fish species is getting affected then the migratory routes, time/season of upstream and downstream migration, spawning grounds etc will be discussed in details.
5.	Green Belt Development Plan along the periphery of the reservoir, approach roads around the colonies and other project components, local plant species must be suggested with physical and financial details. A layout map showing the proposed sites for developing the green belt should be prepared.
6.	Environmental Monitoring Programme to monitor the mitigatory measures implemented at the project site is required will be prepared. Provision for Environment Management Cell should be made. The plan will spell out the aspects required to be monitored, monitoring indicators/parameters with respect to each aspect and the agency responsible for the monitoring of that particular aspect throughout the project implementation.
7.	Catchment Area Treatment (CAT) Plan should be prepared micro-watershed wise. Identification of free draining/ directly draining catchment based upon Remote Sensing and Geographical Information System (GIS) methodology and Sediment Yield Index (SYI) method of AISLUS, Deptt. of Agriculture, Govt. of India coupled with ground survey. Areas or watersheds falling under 'very severe' and 'severe' erosion categories should be provided and required to be treated. Both biological as well as engineering measures should be proposed in consultation with State Forest Department for areas requiring treatment. Year-wise schedule of work and monetary allocation should be provided. Mitigation measures to check shifting cultivation in the catchment area with provision for alternative and better agricultural practices should be included.
8.	Study of Design Earthquake Parameters: A site specific study of earthquake parameters should be done. Results of the site specific earthquake design parameters should be approved by National Committee of Seismic Design Parameters, Central Water Commission (NCSDP), New Delhi.
9.	Dam Break Analysis and Disaster Management Plan The outputs of dam break model should be illustrated with appropriate graphs and maps clearly bringing out the impact of Dam Break scenario. To identify inundation areas, population and structures likely to be affected due to catastrophic floods in the event of dam failure. DMP will be prepared with the help of Dam Break Analysis. Maximum water level that would be attained at various points on the downstream in case of dam break will be marked on a detailed contour map of the downstream area, to show the extent of inundation. The action plan will include Emergency Action and Management plan including measures like preventive action notification, warning procedure and action plan for co-ordination with various authorities.
10.	Reservoir Rim Treatment Plan for stabilization of land slide / land slip zones, if any, around the reservoir periphery is to be prepared based on detailed survey of geology of the reservoir rim area. Suitable engineering and biological measures for treatment of identified slip zones to be suggested with physical and financial schedule. Layout map showing the landslide/landslip zones shall be prepared and appended in the chapter.
11.	Muck Disposal Plan- suitable sites for dumping of excavated material should be identified in consultation with the State Pollution Control Board and Forest Department. All Muck disposal sites should be minimum 30 m away from the HFL of river. Plan for rehabilitation of muck disposal sites should also be given. The L- section/ cross section of muck disposal sites and approach roads to be given. Financial out lay for this may be given separately. Deatailed muck transportation plan delinating the path ways, number of trucks, quantity of muck to be transportated along with monitoring mechanism using latest technology, shall be prepared.
1	Restoration Plan for Quarry Sites and landscaping of colony areas, working areas, roads etc. Details of

2.	the coarse/fine aggregate/clay etc. required for construction of the project and the rock/clay quarries/river shoal sites identified for the project should be discussed along-with the Engineering and Biological measures proposed for their restoration with physical and financial details. Layout map showing quarry sites vis-à-vis other project components, should be prepared.
13.	Resettlement and Rehabilitation Plan needed to be prepared on the basis of findings of the socio-economic survey coupled with the outcome of public consultation held. The R&R package shall be prepared after consultation with the representatives of the project affected families and the State Government. Detailed budgetary estimates are to be provided. Resettlements site should be identified. The plan will also incorporate community development strategies.
14.	Public Health Delivery Plan including the provisions of drinking water supply for local population shall be in the EIA/EMP Report. Status of the existing medical facilities in the project area shall be discussed. Possibilities of strengthening of existing medical facilities, construction of new medical infrastructure etc. will be explored after assessing the need of the labour force and local populace.
15.	Local Area Development Plan to be formulated in consultation with the Revenue Officials and Village Pancahayats. Appropriate schemes shall be prepared under EMP for the Local Area Development Plan with sufficient financial provisions.
16.	Labour Management Plan for their Health and Safety.
17.	Sanitation and Solid waste management plan for domestic waste from colonies and labour camps etc.
18.	Energy Conservation Measures for the work force during construction with physical and financial details. Alternatives will be proposed for the labour force so that the exploitation of the natural resource (wood) for the domestic and commercial use is curbed.
19.	Environmental safeguards during construction activities including Road Construction.
20.	A summary of Cost Estimates for all the plans, cost for implementing all the Environmental Management Plans.
21.	Water, Air and Noise Management Plans to be implemented during construction and post-construction periods.

3.4. Agenda Item No 4:

3.4.1. Details of the proposal

GREENKO BR-01 OFF-STREAM CLOSED LOOP PUMPED STORAGE PROJECT by **GREENKO BR01 IREP PRIVATE LIMITED** located at **NAWADA,BIHAR**			
Proposal For		Fresh ToR	
Proposal No	**File No**	**Submission Date**	**Activity** **Sub-Activity** **(Schedule Item)**
IA/BR/RIV/575575/202	J-12011/22/2026-IA.I(	20/04/2026	River Valley/Irrigation projects

6	R)		Standalone Pump Storage Projects (1(c))

3.4.2. Project Salient Features

53.4.1 The proposal is for grant of Terms of Reference (ToR) to the project Greenko BR-01 Closed Loop Pumped Storage Project (1200 MW) in an area of 310.88 Ha located at Sub District Gobindpur, Akbarpur and Rajauli, District Nawada, Bihar M/s Greenko BR01 IREP Private Limited.

52.4.2 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. The proposed Greenko BR-01 OCPSP is a self-identified project and Greenko Group has been in the process of evaluating suitable locations for such Hydro Storage for over 1 year and has identified near Parsauni & Tupariya village, Rajauli Subdivision, Nawada District, Bihar for the proposed Greenko BR-01 OCPSP.

ii. The Off-Stream Closed Loop Pumped Storage Component of Greenko BR-01 OCPSP envisages construction of upper reservoir near Ekamba Village, Jogya maran Panchyat, Rajauli Sub-Division, Nawada district, Bihar State and lower reservoir near Parsauni & Tupariya Village, Sughari Panchayat, Gobindpur Circle, Rajauli Block/Subdivision, Nawada district, Bihar State. The one-time requirement of 0.321 TMC of water will be lifted from existing Sakri River to fill up the proposed Greenko BR-01 OCPSP lower reservoir which is located at about 9 km from the proposed lower reservoir.

iii. The Greenko BR-01 Off-Stream Closed Loop Pumped Storage Project is proposed with a Storage Capacity of 7316 MWH with Rating of 1200 MW. This Project is comprising of 4 units of 300 MW each. The installed capacity of a pumped storage scheme is influenced by the requirements of daily peaking power requirements, flexibility in efficient operation of units, storage available in the reservoirs and the area capacity characteristics.

iv. The Project will generate 1200 MW by utilizing a design discharge of 361.21 Cumec and rated head of 381.50 m for all four units. The Greenko BR-01 OCPSP will utilize 3222 Mu to pump 0.28 TMC of water to the upper reservoir in 7.04 hours.

v. The geographical co-ordinate of the project is Upper reservoir is at Longitude 85°36'35" East and Latitude is 24°41'30" North and that of Lower reservoir is at longitude 85°36'50" East and latitude is 24°42'35" North.

vi. The Greenko BR-01 Off-Stream Closed Loop Pumped Storage Project (1200 MW) envisages construction of:

- Geomembrane Faced Rock fill Dam Embankment of weighted average height of around 17m with maximum of 48m height in upper reservoir and weighted average height of around 17m with maximum of 22m in lower reservoir for creation of Greenko BR-01 OCPSP upper & lower reservoir with 0.28 & 0.285 TMC live storage capacity respectively
- 44.0 m high Power Intake Structure.
- 2 nos. of 1112.40 m long and 6.5m dia. circular steel lined Penstocks/ Pressure Shafts (i.e., consisting of 30 m long Intake Tunnel, 558.25 m long surface penstock, 200.14 m long vertical pressure shaft and 324 m long Horizontal pressure shaft up to bifurcation point) will get bifurcated into 2 nos. near power house each of 4.5m dia. of about 100m long penstock/pressure shaft to feed 2 units of 300 MW.
- A surface Powerhouse having an installation of Four reversible Francis turbine each of 300 MW capacity (all units are Fixed speed turbines) operating under a rated head of 381.50 m in generating mode & 400.50m in pumping mode.

vii. **Land requirement:**

The total land requirement for proposed project is about 310.88 Ha; out of which 231.41 Ha is forest land and remaining 79.47 Ha is non-forest land.

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

Ø The villages located in and around the project area are small, dispersed, and predominantly dependent on agriculture. Overall population density is lower than the state average.

- Ø Most residents rely on farming, livestock rearing, fishing, and daily wage labour for their livelihood.
- Ø Although basic amenities such as schools, healthcare centres, and road connectivity are present, they are still not fully developed.
- Ø The proportion of Scheduled Tribe population in the project area is very low.
- Ø Major crops cultivated in the region include rice, wheat, pigeon pea, lentils, and other seasonal produce.
- Ø According to the Census of India (2011), most of the villages in the project area are uninhabited, including **Ekamba, Parsauni, Tupariya, Jhirkhi,** and others.

Parameters	**Budhuwa**	**Ektara**	**Jaipur**	**Dhanpuri**	**Jatsari**
Households	167	431	37	225	121
Total Population	1486	2868	221	1541	735
Male Population	741	1471	116	763	397
Femal	745	1397	105	778	338

e Population					
Scheduled Caste (SC) Pop.	163	1384	218	455	346
Scheduled Tribe (ST) Pop.	0	0	0	4	0

(Source: Census 2011)

- Ektara is the largest settlement with 431 households and a population of 2,868, followed by Dhanpuri with 1,541 people in 225 households.
- Budhuwa has a moderate population of 1,486 while Jatsari and Jaipur are the smallest villages with 735 and 221 residents respectively.
- Across all villages, the male and female populations are fairly balanced, with no major gender disparity.
- The presence of Scheduled Caste (SC) communities is notable in all villages, particularly in Jaipur (218) and Jatsari (346), indicating a substantial SC population share as per total population.

- Scheduled Tribe (ST) populations are almost negligible.

ix. **Water requirement:**

The water requirement for the project for initial filling (one-time) is about 9.09 Mm^3 (0.321 TMC) and the net annual evaporation losses will be around 1.416 Mm^3 (0.05 TMC) to be recouped annually from Sakri river.

x. **Project Cost:**

The estimated project cost is Rs 7807.89 Crores. Total capital cost earmarked towards environmental pollution control measures will be worked out during EIA study as well as the Recurring cost (operation and maintenance).

xi. **Project Benefit:**

The project is expected to generate significant employment potential during both the construction and post-construction phases, contributing to local livelihood opportunities. Additionally, it will support the overall development of the area through the implementation of Corporate Social Responsibility (CSR) initiatives and comprehensive watershed development plans.

xii. **Environmental Sensitive area:**

The project is located around 5.5 km from Rajauli (Nawada) Wildlife Sanctuary. Since the ESZ boundary notification is in draft stage, wildlife clearance is applicable. Water will be pumped from Sakri River.

xiii. **MoU / any other clearance/ permission signed with State government:**

MoU is entered with Bihar state government on 16.12.2025 for a capacity of 1200 MW

xiv. **Resettlement and rehabilitation:** Based on the findings of the socio-economic studies and survey during EIA studies, an appropriate R&R compensation package as per the provisions of Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement, 2013 (RFCTLARR, 2013) and respective State R&R Policy in vogue would be required to be formulated.

xv. **Alternative Studies:**

Three alternative layouts were considered for the project. Alternative-1 is preferred as it minimizes reservoir embankment and tail race tunnel lengths and allows partial surface penstock, resulting in lower construction time, cost, and complexity. Alternatives-2 and-3 involve longer underground structures, additional surge tank or tail race channel, higher land and forest requirements, and greater environmental and economic impacts, making them techno-economically unviable.

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

The solid waste will be transported for disposal at the designated landfill sites. The bio-degradable portion of the solid waste would be disposed of by composting. Project will identify authorized vendors for recycling or disposal of Hazardous waste like used batteries, used oil and used oil filters. The total quantity of muck likely to be generated from excavation including construction of road is about 8.29 Mcum. The entire excavated material, after reutilization, is proposed to be disposed of at two designated muck disposal sites covering areas of 15 hectares and 10 hectares, respectively.

xvii. **Status of Litigation Pending against the proposal, if any:** NA

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

· **Project details:**

Name of the P	Greenko BR-01

roposal	Off-stream Closed Loop Pumped Storage Project
Location (Including coordina	The project is located in Ekamba, Parsa

tes)	uni & Tupariya villages, Gobindpur, Akbarpur, & Rajauli Subdivisions, Nawada Dist

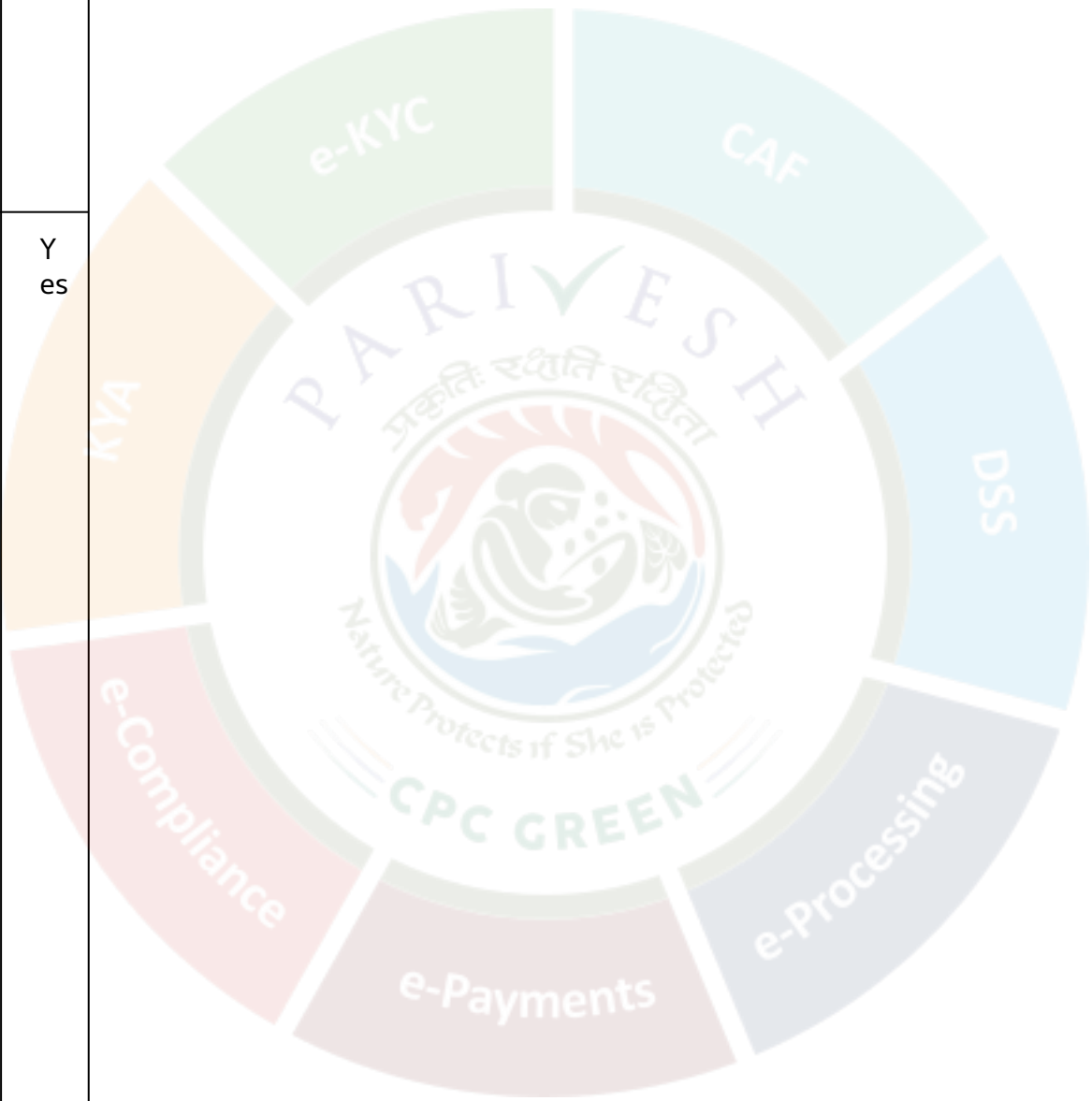
	rict, Bihar. Upper Reservoir - Latitude: 24° 41' 30" N Longitude: 85° 36' 35" E
Inter-state issu	No

e involved	
Seismic zone	Zone III and IV

· **Category details:**

Category of the project	1 (c)
Provisions	
Capacity/Cultu	1200MW

ral command area (CCA)	
Attracts the General Conditions (Yes/No)	Yes
Additional info	NA



rmation (if any)	

· **Electricity generation capacity:**

Powerhouse Installed Capacity	1200 MW
Generation of Electricity An	2537 MU

nually	
No. of Units	4X300MW
Additional information (if any)	NA

· **ToR/EC Details:**

Cost of project	7807.89 crores
Total area of Project	310.88 H

	a
Height of Dam from River Bed (EL)	Upper Reservoir: 48m & Lower Reservoir: 22m
Length of Tunnel/Channel	3559m (WCS length)
Details of Submergence area	185.69 Ha

Types of Waste and quantity of generation during construction/ Operation	Major waste generation is muck from me excavation. Total quantity of excavated material is worke

	d outas 8.29 Mcum
E-Flows for the Project	NA
Is Projects earlier studies in Cumulative Impact assessment & Carrying Capacity studies (CIA&CC) for River in which project located. If yes, then a) E-flow with TOR / Recommendation by EAC	NA

as per CI A&CC study of River Basin. b) If not the E-Flows maintain criteria for sustaining river ecosystem.	
No. of trees/saplings proposed in view of 'Ek Ped Maa Ke Naam' campaign	500

· **Muck Management Details:**

No. of proposed disposal area/(type of land- Forest/ Pvt. land)	Non-Forest Land – 25 Ha, comprising of 2 Muck disposal sites of 15 Ha and 10 Ha each
Muck Management Plan	The total quantity of muck generated is 8.

	29 Mcum, in which 4.93 Mcum of excavated muck is expected to be reutilized. The Rehabilitation plan of muck du

	mpingsite includesengineeringandbiologicalmeasuresandwillbeincorporatedinEIAreport.
Monitoring	Properly cov

mechanism for Muck Disposal	ered Dumper trucks will be used for transportation.

· **Land Area Breakup:**

Private land	79.47 Ha
Government land	-
Forest L	231.41 H

and	a
Total Land	310.888 Ha
Submergence area/ Reservoir area	185.69 Ha
Additional information	-

n (if any)	

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

Forest Land/ Protected Area/ Environmental Sensitivity Zone	**Yes/ No**	**Details of Certificate/ letter/ Remarks**
Reserver	Yes	231.41 Ha forest lan

veForest/ProtectedForestLand		d to be diverted. Application for the diversion of forest land is yet to be submitted as it is in the preparation stage.
National Park	No	
Wildlife Sanctuary	Yes	· The project is located arou

		nd 5.5 km from Rajauli (Nawada) Wildlife Sanctuary. · Since the ESZ boundary

		notification is in draft stage, will dlife clearance is applicable.

- **Court case details: Nil**
- **Miscellaneous**

Particulars	**Details**
Details of c	M/s. R S Enviroli nk Technologies Pvt. Ltd. (RSET) (*NABET* Accredite

on sul ta nt	d *Consultant Org anization*) Certificate No : NABET/EIA/25-28/RA0415 Validity : August 15, 2028 Contact Person: Mr. Ravinder Bhatia Name of Sector: River Valley and Hydroelectric Projects Category : A MoEF Schedule: I(C) Address : 403, Bestech Chambers, Block-B, Sushant Lok Phase I, Sector 43, Gurugram, Haryana - 122009 E-mail : ravi@rstechnologies.co.in

	Land Line : (0124) 4295383 Cellular : (+91) 9810136853
Project Benefits	The project is expected to generate significant employment potential during both the construction and post-construction phases, contributing to local livelihood opportunities. Additionally, it will support the overall development of the area through the implementation of Corporate Social Responsibility (CSR) initiatives and comprehensive watershed development plans
Status of other statutory clearances	Forest Clearance - Online application seeking forest diversion for around 231.41 Ha will be submitted after receipt of ToR Approval. Alongside, other statutory clearances (as applicable) from State as well as Central government will be obtained post completion of Detailed Project Report.
R&R details	Applicable. Based on the findings of the socio-economic studies and survey, an appropriate R&R comp

	ensation package as per the provisions of Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement, 2013 (RFCTLARR, 2013) and respective State R&R Policy in vogue would be required to be formulated.
Additional detail (If any)	NA

3.4.3. Deliberations by the committee in previous meetings

N/A

3.4.4. Deliberations by the EAC in current meetings

The EAC during deliberations noted the following:

· The Expert Appraisal Committee (EAC) deliberated on the information submitted (Form 1, PFR, kml file, etc.) and as presented in the meeting and observed that the proposal is for grant of TOR for conducting EIA/EMP and Public hearing for Greenko BR-01 Closed Loop Pumped Storage Project (1200 MW) in an area of 310.88 Ha located at Sub District Gobindpur, Akbarpur and Rajauli, District Nawada, Bihar M/s Greenko BR01 IREP Private Limited.

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

· The EAC noted that as per the details submitted by the PP, the upper reservoir and lower reservoir are located away from any riverine system, therefore the current proposal is termed as a Closed Loop Pumped Storage Project.

· The EAC observed that the total land required for the project components and related works has been estimated to be about 310.88 Ha; out of which 231.41 Ha is forest land and remaining 79.47 Ha is non-forest land. Diversion of forest land for non-forest purpose will be involved for construction of project components. However, it was observed that the

application for Stage-I Forest Clearance (FC) has not yet been submitted, which necessitates further action from the Project Proponent. The water requirement for the project for initial filling (one-time) is about 9.09 Mm3 (0.321 TMC) and the net annual evaporation losses will be around 1.416 Mm3 (0.05 TMC) to be recouped annually from Sakri river.

· The EAC noted that the proposed project is located approximately 5.5 km from Rajauli (Nawada) Wildlife Sanctuary. As the Eco-Sensitive Zone (ESZ) notification is presently in draft stage, Wildlife Clearance is applicable; accordingly, the EAC was of the view that PP shall obtain prior clearance from the National Board for Wildlife (NBWL).

· The Committee observed that another project is located in close proximity to the present proposal; therefore, in order to minimize land requirement, including forest land, the EAC suggested that the Project Proponent explore the feasibility of integrating/shared access roads for the upper reservoirs of both projects.

· The EAC observed that Memorandum of Understanding was signed between Bihar State Power Generation Company Limited (BSPGCL) and M/s Greenko Energies Private Limited on 16.12.2025. However, the present proposal has been submitted in the name of M/s Greenko BR01 IREP Private Limited, whereas the MoU is in the name of M/s Greenko Energies Private Limited. Accordingly, the Committee opined that amendment/revision of the existing MoU is required to reflect the correct name of the Project Proponent.

53.4.4 The EAC based on the information submitted and as presented during the meeting, recommended the proposal for grant of Specific ToR issued by the Ministry for Close Loop Pumped Storage Projects vide OM dated 14.08.2023 for conducting EIA study for proposed construction of the project for Greenko BR-01 Closed Loop Pumped Storage Project (1200 MW) in an area of 310.88 Ha located at Sub District Gobindpur, Akbarpur and Rajauli, District Nawada, Bihar M/s Greenko BR01 IREP Private Limited., under the provisions of EIA Notification, 2006, as amended along with the following additional/specific ToR:

3.4.5. Recommendation of EAC

Recommended

3.4.6. Details of Terms of Reference

3.4.6.1. Specific

Miscellaneous:	
1.	Both capital and recurring expenditure under EMP shall be submitted.
2.	Pre-DPR Chapters viz., Hydrology, Layout Map and Power Potential Studies duly appraised by CWC/CEA shall be submitted.
3.	The PP should submit the photograph of monitoring stations & sampling locations. The photograph should bear the date, time, latitude & longitude of the monitoring station/sampling location. In addition to this PP should submit the original test reports and certificates of the labs which will analyze the samples.
4.	Drone video of project site shall be recorded and to be submitted.
5.	Detailed plan to restore wider roads and convert them into narrow up to 10m after

	construction of the project.
6.	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.
7.	As per Ministry's OM dated 1st August, 2013, PP shall submit application to obtain prior approval of Central Government under the Forest Conservation Act, 1980 for diversion of forest land required for such projects will be submitted as soon as the actual extent of forest land required for the project is known to the project proponent, and in any case, within 6 months of issuance of ToR. However, no proposal will be put up before EAC without submission of application for forest clearance, wherever applicable.
8.	The EAC will conduct site visit before considering the proposal for grant of environmental clearance.
9.	PP shall provide details of acquisition of land for the proposed project as per OM no. 22-76/2014-IA.III dated 07.10.2014.
Disaster Management:	
1.	Impact of Project activities (specially blasting and drilling) on the aquatic and terrestrial ecosystem, within study area to be studied and be incorporated in EIA/EMP report.
2.	The muck dumping sites shall be located with a distance of 100 mts from HFL. The PP shall submit the detailed action plan for transportation of muck along with monitoring mechanism of movement of muck carrying trucks.
Muck Management:	
1.	Details of quantity of muck generation component wise, types of muck (Excavation in tunnels, pressure shaft and powerhouse etc.) and disposal site/ transportation to be provided.
2.	Details of 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.
Socio-economic Study:	
1.	Declaration by the project proponent by way of affidavit that "No" Inter-state issue/ policy

	issue is involved with any State in the project.
2.	All the tasks including conducting public hearing shall be done as per the provisions of EIA Notification, 2006 and as amended from time to time. A comparative chart of issues raised by General Public during Public Hearing and commitments made by the Project Proponent will be prepared and submitted in the relevant chapter of EIA/EMP report.
3.	The EIA/EMP shall include a detailed socio-economic assessment of the tribal population in the project-affected area based on primary data and community consultations. A Tribal Development Plan, prepared in consultation with the District Administration and Tribal Welfare Department, shall be submitted along with the EIA report.
4.	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.
5.	Land acquired for the project shall be suitably compensated in accordance with the law of the land with the prevailing guidelines. Private land (if any) shall be acquired as per provisions of Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013. Budget earmarked for R&R, CSR shall not be included in the cost of EMP.
Environmental Management and Biodiversity Conservation:	
1.	PP shall obtain amendment/revision of the existing MoU to reflect the correct name of the Project Proponent.
2.	PP shall obtain prior clearance from the National Board for Wildlife (NBWL).
3.	PP shall explore the possibilities to integrate access roads for the upper reservoirs with nearby projects in order to minimize overall land requirement, including forest land.
4.	A detailed action plan for large scale plantation of native species of plant sapling within 10 km radius of the project shall be prepared in consultation with State Forest Department. The monitoring mechanism to ensure the survival of saplings shall be finalized in consultation with ICFRE.
5.	The PP will submit 10 years water availability data certified by the CWC/State Water Resource Department for quantity of water that is received annually by the small stream on which lower reservoir is proposed to be constructed.
6.	The PP will submit a detailed plan and monitoring mechanism for releasing the self - catchment water of small stream draining in to river along with action plan for conservation and protection of other streams/rivulets draining in to upper and lower reservoirs.
7.	Explore the possibilities for reducing the Forest land requirement. The application for obtaining Stage I FC for 231.41 Ha of forest land involved in the project shall be submitted within stipulated time.
8.	Muck disposal site and other components such as Township, site office, Stacking area and batching plant shall be located outside the forest area.

9.	Certificate and certified map from Chief Wildlife Warden shall be submitted mentioning that project boundary is not falling in any Ecological Sensitive Area, Wildlife Sanctuary/Tiger/elephant corridor/Critically polluted area within 10 km of Project site.
10.	Transportation Plan for transporting construction materials shall be submitted. Separate chapter for risk assessment of such transportation through/within proposed the Wildlife Sanctuary shall be included in the EIA report, if any.
11.	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.
12.	The baseline data collection will cover the changes in biological and ecological profile of the region after monsoon with worst-case scenario study and critical mineral assessment.
13.	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.
14.	The longitudinal connectivity/Free flowing sketch be provided in the EIA/EMP report.
15.	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.
16.	Conducting site-specific ecological study emphasizing on riverine ecology viz. fishes diversity, fish migration, habitat and aquatic biota due to construction PSP. Impact assessment on the fish diversity based on the hydrological alteration at the water drawing sources shall be studied.
17.	Action plan for survival or diversion of the rivulets/stream, if any, leading to join river shall be submitted.
18.	Impact zone decided prior to base line data generation and accordingly, sampling location shall be finalized. Baseline data as mentioned in Specific ToR shall be collected for preparation of EIA/ EMP report along with soil characteristics which shall be studied at minimum 10 locations. The ground water level at 10 locations shall be measured in project area in all seasons.
19.	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.
20.	Reservoir/ River banks protection plan all along the submergence need to be prepared and incorporated in EIA/ EMP.
21.	Scope of watershed development in the 10 km radius of the project shall be studied in consultation with Indian Council of Agriculture Research (ICAR) Institutes/ Expert Govt. institutions and accordingly a detailed Water Shed Development Plan shall be prepared and incorporated in EIA/ EMP report.

22.	Details of mineral zone, if any, in the study area, certified by Geological Survey of India or any other concerned Government Organization shall be submitted. The project area should not come up on any critical mineral zone, the same shall to be verified by GSI/NMDC.
23.	Any archaeological sites in the vicinity of the project, if any, then it shall be certified by ASI.
24.	Combined Impact of projects proposed in the basin on carrying capacity and sustainability of Reservoir/ River /nala of catchment area due to tapping of water for filling reservoir shall be studied.

3.4.6.2. Standard

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

10.	Geological and Seismo-tectonic details and maps of the area surrounding the proposed project site showing location of dam site and canal sites.
11.	Remote Sensing studies, interpretation of satellite imagery, topographic sheets along with ground verification shall be used to develop the land use/land cover pattern of the study using overlaying mapping techniques viz. Geographic Information System (GIS), False Color Composite (FCC) generated from satellite data of project area.
12.	Land details including forests, private and other land.
13.	Demarcation of snow fed and rain fed areas for a realistic estimate of the water availability.
14.	Different riverine habitats like rapids, pools, side pools and variations in the river substratum bedrocks, rocks, boulders, sand/silt or clay etc. need to be covered under the study
Description of Environment and Baseline Data	
1.	To know the present status of environment in the area, baseline data with respect to environmental components air, water, noise, soil, land and biology & biodiversity (flora & fauna), wildlife, socioeconomic status etc. should be collected within 10 km radius of the main components of the project/site i.e. dam site and power house site. The air quality and noise are to be monitored at such locations which are environmentally & ecologically more sensitive in the study area. The baseline studies should be collected for 1 season (Preferably Monsoon season). Flora-Fauna in the catchment and command area should be documented. The study area should comprise of the following:
2.	(i) Catchment area up to the dam/barrage site.
3.	(ii) Submergence Area.
4.	(iii) Project area or the direct impact area should comprise of area within 10 km radius of the main project components like dam, canals etc.
5.	(iv) Downstream upto 10 km from the tip of the reservoir.
Details of the Methology	
1.	The methodology followed for collection of base line data along with details of number of samples and their locations in the map should be included. Study area should be demarcated properly on the appropriate scale map. Sampling sites should be depicted on map for each parameter with proper legends. For Forest Classification, Champion and Seth (1968) methodology should be followed.
Methodology for Collection of Biodiversity Data	
1.	The number of sampling locations should be adequate to get a reasonable idea of the diversity and other attributes of flora and fauna. The guiding principles should be the size of the study area (larger area should have larger number of sampling locations) and inherent diversity at the location, as known from secondary sources (e.g. eastern Himalayan and low altitude sites should have a larger number of sampling locations owing to higher diversity).
2.	The entire area should be divided in grids of 5kmX5km preferably on a GIS domain. There after 25% of the grids should be randomly selected for sampling of which half should be in the directly affected area (grids including project components such as reservoir, dam, powerhouse, tunnel, canal etc.) and the

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

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

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

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

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

9.	ethnic/indigenous groups that are getting affected by the project.
Impact Prediction and Mitigation Measures	
1.	The adverse impact due to the proposed project should be assessed and effective mitigation steps to abate these impacts should be described.
2.	Changes in ambient and ground level concentrations due to total emissions from point, line and area sources.
3.	Effect on soil, material, vegetation and human health.
4.	Impact of emissions from DG set used for power during the construction, if any, on air environment.
5.	Pollution due to fuel combustion in equipments and vehicles
6.	Fugitive emissions from various sources
7.	Changes in surface and ground water quality
8.	Steps to develop pisci-culture and recreational facilities
9.	Changes in hydraulic regime and downstream flow.
10.	Water pollution due to disposal of sewage
11.	Water pollution from labour colonies/ camps and washing equipment.
12.	Adverse impact on land stability, catchment of soil erosion, reservoir sedimentation and spring flow (if any) (a) due to considerable road construction / widening activity (b) interference of reservoir with the inflowing stream (c) blasting for commissioning of HRT, TRT and some other structures.
13.	Changes in land use / land cover and drainage pattern
14.	Immigration of labour population
15.	Quarrying operation and muck disposal
16.	Changes in land quality including effects of waste disposal
17.	River bank and their stability
18.	Impact due to submergence.
1	Impact on forests, flora, fauna including wildlife, migratory avi-fauna, rare and endangered species,

9.	medicinal plants etc.
20.	Pressure on existing natural resources
21.	Deforestation and disturbance to wildlife, habitat fragmentation and wild animal's migratory corridors
22.	Compensatory afforestation-identification of suitable native tree species for compensatory afforestation and green belt.
23.	Impact on fish migration and habitat degradation due to decreased flow of water
24.	Impact on breeding and nesting grounds of animals and fish.
25.	Impact on local community including demographic profile.
26.	Impact on socio-economic status
27.	Impact on economic status.
28.	Impact on human health due to water / vector borne disease
29.	Impact on increase traffic
30.	Impact on Holy Places and Tourism
31.	Impacts of blasting activity during project construction which generally destabilize the land mass and leads to landslides, damage to properties and drying up of natural springs and cause noise population will be studies. Proper record shall be maintained of the baseline information in the post project period.
32.	Positive and negative impacts likely to be accrued due to the project are listed.
Environmental Management Plan	
1.	null
2.	Biodiversity and Wildlife Conservation and Management Plan for the conservation and preservation of rare, endangered or endemic floral/faunal species or some National Park/Sanctuary/ Biosphere Reserve or other protected area is going to get affected directly or indirectly by construction of the project, then suitable conservation measures should be prepared in consultation with the State Forest Department and with the physical and financial details. Suitable conservation techniques (in-situ/ ex-situ) will be proposed under the plan and the areas where such conservation is proposed will be marked on a project layout map.

3.	Compensatory Afforestation shall be prepared by the State Forest Department in lieu of the forest land proposed to be diverted for construction of the project as per the Forest (Conservation) Act, 1980. Choice of plants for afforestation should include native and RET species, if any. This will be a part of the forest clearance proposal.
4.	Fisheries Conservation and Management Plan - a specific fisheries management measures should be prepared for river and reservoir. If the construction of fish ladder/ fish-way etc. is not feasible then measures for reservoir fisheries will be proposed. The plan will detail out the number of hatcheries, nurseries, rearing ponds etc. proposed under the plan with proper drawings. If any migratory fish species is getting affected then the migratory routes, time/season of upstream and downstream migration, spawning grounds etc will be discussed in details.
5.	Green Belt Development Plan along the periphery of the reservoir, approach roads around the colonies and other project components, local plant species must be suggested with physical and financial details. A layout map showing the proposed sites for developing the green belt should be prepared.
6.	Environmental Monitoring Programme to monitor the mitigatory measures implemented at the project site is required will be prepared. Provision for Environment Management Cell should be made. The plan will spell out the aspects required to be monitored, monitoring indicators/parameters with respect to each aspect and the agency responsible for the monitoring of that particular aspect throughout the project implementation.
7.	Catchment Area Treatment (CAT) Plan should be prepared micro-watershed wise. Identification of free draining/ directly draining catchment based upon Remote Sensing and Geographical Information System (GIS) methodology and Sediment Yield Index (SYI) method of AISLUS, Deptt. of Agriculture, Govt. of India coupled with ground survey. Areas or watersheds falling under 'very severe' and 'severe' erosion categories should be provided and required to be treated. Both biological as well as engineering measures should be proposed in consultation with State Forest Department for areas requiring treatment. Year-wise schedule of work and monetary allocation should be provided. Mitigation measures to check shifting cultivation in the catchment area with provision for alternative and better agricultural practices should be included.
8.	Study of Design Earthquake Parameters: A site specific study of earthquake parameters should be done. Results of the site specific earthquake design parameters should be approved by National Committee of Seismic Design Parameters, Central Water Commission (NCSDP), New Delhi.
9.	Dam Break Analysis and Disaster Management Plan The outputs of dam break model should be illustrated with appropriate graphs and maps clearly bringing out the impact of Dam Break scenario. To identify inundation areas, population and structures likely to be affected due to catastrophic floods in the event of dam failure. DMP will be prepared with the help of Dam Break Analysis. Maximum water level that would be attained at various points on the downstream in case of dam break will be marked on a detailed contour map of the downstream area, to show the extent of inundation. The action plan will include Emergency Action and Management plan including measures like preventive action notification, warning procedure and action plan for co-ordination with various authorities.
10.	Reservoir Rim Treatment Plan for stabilization of land slide / land slip zones, if any, around the reservoir periphery is to be prepared based on detailed survey of geology of the reservoir rim area. Suitable engineering and biological measures for treatment of identified slip zones to be suggested with physical and financial schedule. Layout map showing the landslide/landslip zones shall be prepared and appended in the chapter.
11.	Muck Disposal Plan- suitable sites for dumping of excavated material should be identified in consultation with the State Pollution Control Board and Forest Department. All Muck disposal sites should be minimum 30 m away from the HFL of river. Plan for rehabilitation of muck disposal sites should also be given. The L- section/ cross section of muck disposal sites and approach roads to be given. Financial out

	lay for this may be given separately. Deatailed muck transportation plan delinating the path ways, number of trucks, quantity of muck to be transportated along with monitoring mechanism using latest technology, shall be prepared.
12.	Restoration Plan for Quarry Sites and landscaping of colony areas, working areas, roads etc. Details of the coarse/fine aggregate/clay etc. required for construction of the project and the rock/clay quarries/river shoal sites identified for the project should be discussed along-with the Engineering and Biological measures proposed for their restoration with physical and financial details. Layout map showing quarry sites vis-à-vis other project components, should be prepared.
13.	Resettlement and Rehabilitation Plan needed to be prepared on the basis of findings of the socio-economic survey coupled with the outcome of public consultation held. The R&R package shall be prepared after consultation with the representatives of the project affected families and the State Government. Detailed budgetary estimates are to be provided. Resettlements site should be identified. The plan will also incorporate community development strategies.
14.	Public Health Delivery Plan including the provisions of drinking water supply for local population shall be in the EIA/EMP Report. Status of the existing medical facilities in the project area shall be discussed. Possibilities of strengthening of existing medical facilities, construction of new medical infrastructure etc. will be explored after assessing the need of the labour force and local populace.
15.	Local Area Development Plan to be formulated in consultation with the Revenue Officials and Village Pancahayats. Appropriate schemes shall be prepared under EMP for the Local Area Development Plan with sufficient financial provisions.
16.	Labour Management Plan for their Health and Safety.
17.	Sanitation and Solid waste management plan for domestic waste from colonies and labour camps etc.
18.	Energy Conservation Measures for the work force during construction with physical and financial details. Alternatives will be proposed for the labour force so that the exploitation of the natural resource (wood) for the domestic and commercial use is curbed.
19.	Environmental safeguards during construction activities including Road Construction.
20.	A summary of Cost Estimates for all the plans, cost for implementing all the Environmental Management Plans.
21.	Water, Air and Noise Management Plans to be implemented during construction and post-construction periods.

Day 2 -30/04/2026

3.1. Agenda Item No 1:

3.1.1. Details of the proposal

Aruna Pumped Storage Project (1500 MW) by **THDC INDIA LIMITED** located at **KOLHAPUR,MAHARASHTRA**	
Proposal For	Fresh ToR

Proposal No	File No	Submission Da te	Activity Sub-Activity (Schedule Item)
IA/MH/RIV/574543/20 26	J-12011/19/2026-IA.I(R)	03/04/2026	River Valley/Irrigation projects Standalone Pump Storage Projects (1(c))

3.1.2. Project Salient Features

The proposal is for grant of Terms of Reference (ToR) to the project Aruna Open Loop Pumped Storage Project (1500 MW) in an area of 334.45 Ha located Sub District Bavda and Vaibhavvadi, District Kolhapur and Sindhudurg, Maharashtra by M/s THDC India Limited.

53.5.2 The Project Proponent and the accredited Consultant M/s. EQMS India Pvt. Ltd made a detailed presentation on the salient features of the project and informed that:

Upper Reservoir Coordinates: 16°35'39.87"N, 73°51'19.51"E

Lower Reservoir Coordinates: 16°36'32.43"N, 73°50'37.75"E

The location of upper reservoir and lower reservoir are fixed as per the topography and storage requirement. The upper reservoir at Vesaraf village shall have gross and live storage capacity of 12.75MCM and 12.08MCM at FRL(El.632M) with MDDL El.604m. The dam length at top and height from deepest bed level shall be 475.5m and 45m respectively Primarily three alternatives water conductor system were studied.

DPR Alternate-1(1000MW): The lower reservoir of DPR Alt – 1 is located at Mounde village and shall have gross and live storage capacity of 9.41MCM and 7.93MCM at FRL(El.305m) with MDDL El.264m.The dam length at top and height from deepest bed level shall be 777.75 m and 84m respectively. Cumulative Length of WCS shall be 2.05km with 0.95lm long TRT and L/H Ratio of 6.42. Powerhouse with installed capacity 1000 MW (4x250MW) shall be underground. Annual energy generation at 95% plant availability shall be 2080.50 MU. Total land requirement shall be 328.95ha comprised of 73.10ha forest land. The total cost of project is Rs 7696.09Cr with a levelized tariff at Rs 4.91 /unit pumping cost shall be Rs 8.10/ unit.

DPR Alternate-2(1500MW): The lower reservoir of DPR Alt – 2 is located upstream of Mounde village and shall have gross and live storage capacity of 12.76MCM and 12.00 MCM at FRL(El.291m) with MDDL El.248m.The dam length at top and height from deepest bed level shall be 480.70 m and 69m respectively. Cumulative Length of WCS shall be 1.16km with 0.342km long TRT and L/H Ratio of 3.45. Powerhouse with installed capacity 1500 MW (6x250MW) shall be underground. Annual energy generation at 95% plant availability shall be 3120.75 MU. Total land requirement shall be 334.45ha comprised of 73.60ha forest land. The total cost of project is Rs 9126.10 with a levelized tariff at Rs 3.88 /unit pumping cost shall be Rs 7.06/ unit

DPR Alternate-3(1000MW): The lower reservoir of DPR Alt – 3 is located upstream of the lower reservoir of DPR Alt – 2 and shall have gross and live storage capacity of 9.40 MCM and 8.69 MCM at FRL(El.335m) with MDDL El.280m.The dam length at top and height from deepest bed level shall be 519.60 m and 90m respectively. Cumulative Length of WCS shall be 1.43km with 0.60km long TRT and L/H Ratio of 4.33. Powerhouse with installed capacity 1000 MW (4x250MW) shall be underground. Annual energy generation at 95% plant availability shall be 2080.5 0MU.Total land requirement shall be 317.49ha comprised of 72.60ha forest land. The total cost of project is Rs 7124.09Cr with a levelized tariff at Rs 4.54 /unit pumping cost shall be Rs 7.75/ unit

Based on the above comparison, DPR Alternative - 2 with minimum interference with Mounde village, 1500 MW capacity, 69 m high dam at lower reservoir and 342 m long TRT provides the most efficient solution. And hence considered for further studies.

(a) Municipal Solid Waste (MSW) likely to be generated during construction and operation shall be 90 Ton/annum and 30 ton/annum respectively which shall be managed as per Solid Wastes Management Rules, 2016.

(b) Hazardous waste: It inter alia includes burnt mobile oil and greases (15 ton/annum) from vehicles and construction machinery and equipment which shall be handled and disposed of through authorized dealer as per Hazardous and other Wastes (Management & Transboundary Movement) Rules, 2016.

(c) The total quantity of muck / debris, to be generated due to the project, shall be 28.93 lakh cum, of which 23.15 lakh cum shall be consumed on project work and balance 5.78 lakh cum shall be

dumped at designated muck sites. Muck piles shall be well supported at base by retaining walls and multi-storied plantation will be developed using grasses, shrubs, bushes, and trees in a site-specific manner.

Name of the Proposal	Aruna PSP (1500 MW), District Kolhapur & Sindhudurg, Maharashtra Proposal No.: IA/MH/RIV/574543/2026 File No. J-12011/19/2026-IA. I(R)
Location (Including coordinates)	Upper Dam: Village Vesaraf Village, Tahsil Bavda, District Kolhapur Lower Dam: Mounde Village, Tahsil Vaibhavwadi, District Sindhudurg Upper Reservoir: 16°35'39.87"N, 73°51'19.51"E Lower Reservoir: 16°36'32.43"N, 73°50'37.75"E
Inter- state issue involved	No
Seismic zone	

Category of the project	A
Provisions	Project activity covered at S.N.1(c)(i)(c) Standalone Pumped Storage Project
Capacity / Cultural command area (CCA)	1500 MW/ 9000 MWH pumped storage component with 6 hours storage capacity for peak power generation and 6.86 hours pumping operation for backfilling of upper reservoir of PSP.
Attracts the General Conditions (Yes/No)	No
Additional information (if any)	MoU was signed between M/s THDCIL and Department of Water Resources, Govt. of Maharashtra on 03rd day of September 2024, for establishment of Aruna PSP.

Powerhouse Installed Capacity	1500 MW
Generation of Electricity Annually	3120.75 MU
No. of Units	6x250MW
Additional information (if any)	The project with installed capacity of 1500 MW(6x250MW) by utilizing a design discharge of 499.21 cumec rated net head of 338 m for 6-hour daily peaking cycle will annually generate 3120.75 MU. The PSP will utilize 1650 MW to pump 435.86 cumec from lower reservoir to the upper reservoir in 6.86 h

<table>
<tr><td></td><td>ours.</td></tr>
<tr><td>Cost of project</td><td>Rs 9126.10 Crores.</td></tr>
<tr><td>Total area of Project</td><td>334.45 ha</td></tr>
<tr><td>Height of Dam from River Bed (EL)</td><td>Upper Dam-45 m; Lower Dam-69 m</td></tr>
<tr><td>Length of Tunnel/Channel</td><td>Length: 5353.80m comprising of following components:
(i) Pressure Shaft :3827.79 m (Main:623.55+Br.: 3204.24
(ii)TRT: 1026.81 m (3x342.27m)
(iii) Draft tube tunnels: 499.20m (6x 83.20m)</td></tr>
<tr><td>Details of Submergence area</td><td>Total Submergence area- 127.81 ha (Forest land: 1 17.81 ha, non-Forest land: 10 ha)</td></tr>
<tr><td>Types of Waste and quantity of genera tion during construction/ Operation</td><td><table><tr><th>Waste Type</th><th>Construction (TPA)</th><th>Operation (TPA)</th></tr><tr><td>MSW</td><td>90</td><td>30</td></tr><tr><td>Plastic</td><td>15.0</td><td>1.0</td></tr><tr><td>E-waste</td><td>2.0</td><td>0.20</td></tr><tr><td>Burnt oil</td><td>15.0</td><td>2.00</td></tr><tr><td>Batteries</td><td>5.0</td><td>0.50</td></tr><tr><td>Bio-medical</td><td>4.0</td><td>2.0</td></tr></table></td></tr>
<tr><td>E-Flows for the Project</td><td></td></tr>
<tr><td>Is Projects earlier studies in Cumulative Impact assessment & Carrying Capacit y studies (CIA&CC) for River in which project located. If yes, then
a) E-flow with TOR /Recommendation by
EAC as per CIA&CC study of River Basi n.
b) If not the E-Flows maintain criteria f or sustaining river ecosystem.</td><td>No
Not applicable
Not applicable in case of PSP</td></tr>
<tr><td>No. of trees/saplings proposed in view of ‘Ek Ped Maa Ke Naam’ campaign</td><td></td></tr>
<tr><td>No. of proposed disposal area/ (type of land- Forest/Pvt land)</td><td>Muck Disposal Sites-2 Nos
Area and Type of land -19 ha (non-forest)</td></tr>
<tr><td>Muck Management Plan</td><td>The muck shall be laid with vertical angle not exceeding 28^0 in such a manner that rock mass is properly stacked behind the gabion wall/revetment with minimum of void s.
The muck pile shall be later covered with geo-Geo-coir t</td></tr>
</table>

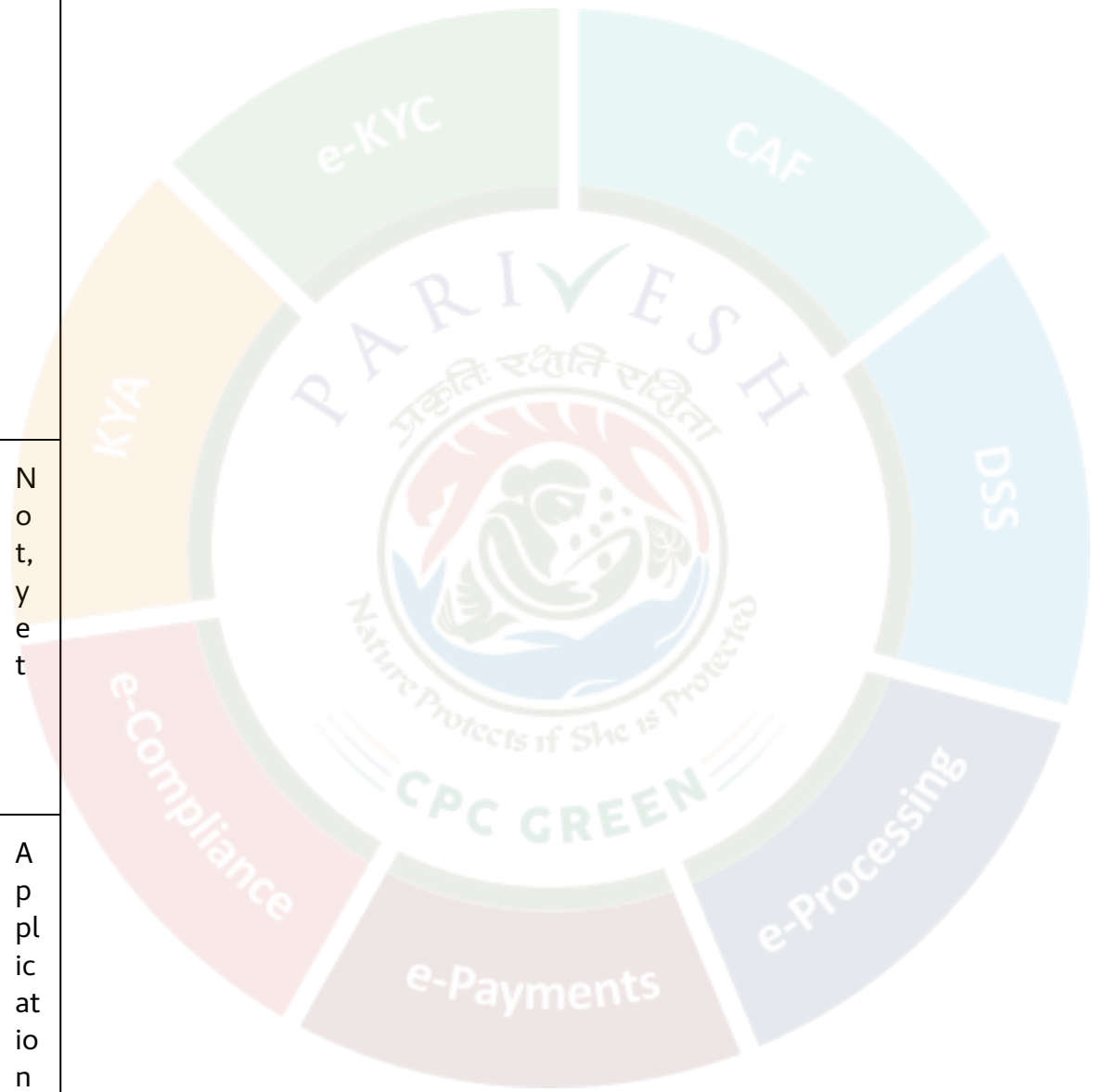
	extile and rehabilitated by afforestation of herbs and shrubs. Detailed Muck Management Plan shall be formulated during EIA study.
Monitoring mechanism for Muck Disposal	The project authorities shall erect a barrier to regulate the traffic flow to and fro the muck piles site. Proper e-challan shall be issued.

Private land	50.00
Government land	210.85
Forest Land	73.60 ha
Total Land	334.45 ha
Submergence area/Reservoir area	127.81 ha
Additional information (if any)	Land for transmission line for power evacuation (RoW) is not included.

Forest Land/ Protected Area/ Environmental Sensitivity Zone	**Yes/No**	**Details of Certificate/ letter/Remarks**
Reserve Forest/Protected Forest Land	Yes	Vesaraf, Aslaj, Bhom and Mounde R/F
National Park	No	None within 10km
Wildlife Sanctuary	No	None within 10km.

Particulars	**Letter no. and date**
C	N

ertifiedECcompliancereport (ifapplicable)	otapplicable
StatusofStage-IFC	Not,yet
Additionaldetail (Ifany)	Applicationfordiversion



	of forest land shall be moved
Is FRA (2006) done for FC-I	Not, yet

Particulars	Details
Details of consultant	EQMS Global Private Limited 305, 3rd Floor, Plot No. 16, Rishabh Corporate Tower, Community Centre, Karkardooma, Delhi – 110092 Phone: 011-43062757; NABET/EIA/25-28/RA0465, valid up to 23.11.2028.)
Project Benefits	The benefits inter alia shall include the benefits like (i) Average annual generation of 3120.75 MU of energ

	y; (ii) Increased vegetal cover due to implementing of CAT Plan and Green Belt Development Plans (iii) Emp loyment Potential during construction (1500 labour); (iv) Overall development of area by implementing CS R initiatives and Watershed Development Plans.
Status of other statutory clearances	The mandatory statutory clearance like approval of p ower potential studies from CEA, site specific earthq uake design parameters to be approved by NCSDP, G eological report approval from GSI, DPR approval fro m CWC and CEA; Forest clearance for diversion of fo rest land, are yet to be sought.
R&R details	R&R details shall be finalised later.
Additional detail (If any)	None

3.1.3. Deliberations by the committee in previous meetings

N/A

3.1.4. Deliberations by the EAC in current meetings

53.3.5 The EAC during deliberations noted the following:

· The Expert Appraisal Committee (EAC) deliberated on the information submitted (Form 1, PFR, kml file, etc.) and as presented in the meeting and observed that the proposal is for grant of TOR for conducting EIA/EMP and Public hearing for Aruna Open Loop Pumped Storage Project (1500 MW) in an area of 334.45 Ha located Sub District Bavda and Vaibhavvadi, District Kolhapur and Sindhudurg, Maharashtra by M/s THDC India Limited.

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

· The EAC observed that the upper dam will be located across a small stream draining into Kumbhi river near Vesaraf village and the lower dam will be located on a small stream draining into Aruna River near Mounde village since both of the reservoirs are located on small stream therefore, the project is termed as Open Loop project.

· The EAC noted that the total land requirement for the proposed project is estimated to be approximately 334.45 ha, of which about 73.60 ha falls within forest land, while the remaining 260.85 ha is non forest land. Diversion of forest land for non-forest purpose will be involved for construction of project components. However, it was observed that the application for Stage-I Forest Clearance (FC) has not yet been submitted, which necessitates further action from the Project Proponent.

· The committee noted that the quantity of water required during construction is estimated as 1230 kld (Construction-1100 kld; Domestic-130kld) and during operation shall be 50kld, which shall be drawn from catchment of local nallas. The initial filling requirement (13.58MCM) of lower reservoir shall be met from rainfall yield of catchment (4.67sq km) in two monsoon seasons besides annual recoupment of evaporation losses and transit losses of

both reservoirs 1.165 MCM (0.711+0.454).

· The EAC observed that Radhanagari Wildlife Sanctuary and its Eco-Sensitive Zone (ESZ) are located approximately 12.48 km and 7.03 km, respectively, from the nearest project boundary. The upper reservoir falls within Gaganbawada Conservation Reserve. Further, the project villages, namely Vesaraf and Mounde, are situated within the Western Ghats Eco-Sensitive Area (ESA) as per Draft Notification S.O. 3060(E) dated 31.07.2024. The Committee also noted that no archaeological monument of national importance or national heritage structure exists within the project or submergence area, and no inter-state or international boundary lies within 10 km of the project boundary.

· The EAC observed that Memorandum of Understanding was signed between M/s THDCIL with Water Resources Department, Govt. of Maharashtra on 03.09.2024 for the establishment of Aruna Pumped Storage Project (1950 MW). However, the present proposal submitted by the PP envisages a decreases capacity of 1500 MW. In view of the substantial decrease in the proposed capacity, the Committee opined that an amendment/revision of the existing MoU shall be required to align it with the revised project configuration.

53.3.4 The EAC based on the information submitted and as presented during the meeting, recommended the proposal for grant of Specific ToR issued by the Ministry for Open Loop Pumped Storage Projects vide OM dated 14.08.2023 for conducting EIA study for proposed construction of the project for Aruna Open Loop Pumped Storage Project (1500 MW) in an area of 334.45 Ha located Sub District Bavda and Vaibhavvadi, District Kolhapur and Sindhudurg, Maharashtra by M/s THDC India Limited, under the provisions of EIA Notification, 2006, as amended along with the following additional/specific ToR:

3.1.5. Recommendation of EAC

Recommended

3.1.6. Details of Terms of Reference

3.1.6.1. Specific

Miscellaneous:	
1.	Both capital and recurring expenditure under EMP shall be submitted.
2.	PP shall follow all the terms and conditions mentioned in draft notification issued by MOEF&CC vide S.O.3060(E) dated 31.07.2024 of Western Ghats ESA for preparation of EIA/EMP report.
3.	Pre-DPR Chapters viz., Hydrology, Layout Map and Power Potential Studies duly appraised by CWC/CEA shall be submitted.
4.	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.
5.	Drone video of project site shall be recorded and to be submitted.

6.	Detailed plan to restore wider roads and convert them into narrow up to 10m after construction of the project.
7.	Specific Terms of Reference (ToRs) issued by the Ministry vide Office Memorandum No. F. No. IA3-22/33/2022-IA.III dated 14.08.2023 for Pumped storage projects shall be used for preparation of EIA/ EMP reports.
8.	As per Ministry's OM dated 1st August, 2013, PP shall submit application to obtain prior approval of Central Government under the Forest Conservation Act, 1980 for diversion of forest land required for such projects will be submitted as soon as the actual extent of forest land required for the project is known to the project proponent, and in any case, within 6 months of issuance of ToR. However, no proposal will be put up before EAC without submission of application for forest clearance, wherever applicable.
9.	PP shall provide details of acquisition of land for the proposed project as per OM no. 22-76/2014-IA.III dated 07.10.2014.
Disaster Management:	
1.	Impact of Project activities (specially blasting and drilling) on the aquatic and terrestrial ecosystem, within study area to be studied and be incorporated in EIA/EMP report.
2.	The muck dumping sites shall be located with a distance of 100 mts from HFL. The PP shall submit the detailed action plan for transportation of muck along with monitoring mechanism of movement of muck carrying trucks.
Muck Management:	
1.	Details of quantity of muck generation component wise, types of muck (Excavation in tunnels, pressure shaft and powerhouse etc.) and disposal site/ transportation to be provided.
2.	Details of 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.
Socio-economic Study:	
1.	Declaration by the project proponent by way of affidavit that "No" Inter-state issue/ policy issue is involved with any State in the project.

2.	All the tasks including conducting public hearing shall be done as per the provisions of EIA Notification, 2006 and as amended from time to time. A comparative chart of issues raised by General Public during Public Hearing and commitments made by the Project Proponent will be prepared and submitted in the relevant chapter of EIA/EMP report.
3.	The EIA/EMP shall include a detailed socio-economic assessment of the tribal population in the project-affected area based on primary data and community consultations. A Tribal Development Plan, prepared in consultation with the District Administration and Tribal Welfare Department, shall be submitted along with the EIA report.
4.	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.
5.	Land acquired for the project shall be suitably compensated in accordance with the law of the land with the prevailing guidelines. Private land (if any) shall be acquired as per provisions of Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013. Budget earmarked for R&R, CSR shall not be included in the cost of EMP.
Environmental Management and Biodiversity Conservation:	
1.	PP shall obtain amendment/revision of the existing MoU to reflect the revised project capacity of 1500 MW.
2.	A detailed action plan for large scale plantation of native species of plant sapling within 10 km radius of the project shall be prepared in consultation with State Forest Department. The monitoring mechanism to ensure the survival of saplings shall be finalized in consultation with ICFRE.
3.	The PP will submit 10 years water availability data certified by the CWC/State Water Resource Department for quantity of water that is received annually by the small stream on which lower reservoir is proposed to be constructed.
4.	The PP will submit a detailed plan and monitoring mechanism for releasing the self - catchment water of small stream draining in to river along with action plan for conservation and protection of other streams/rivulets draining in to upper and lower reservoirs.
5.	Explore the possibilities for reducing the Forest land requirement. The application for obtaining Stage I FC for 73.60 ha of forest land involved in the project shall be submitted within stipulated time.
6.	Muck disposal site and other components such as Township, site office, Stacking area and batching plant shall be located outside the forest area.
7.	Certificate and certified map from Chief Wildlife Warden shall be submitted mentioning that project boundary is not falling in any Ecological Sensitive Area, Wildlife Sanctuary/Tiger/elephant corridor/Critically polluted area within 10 km of Project site.
8.	Transportation Plan for transporting construction materials shall be submitted. Separate chapter for risk assessment of such transportation through/within proposed the Wildlife Sanctuary shall be included in the EIA report, if any.

9.	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.
10.	The baseline data collection will cover the changes in biological and ecological profile of the region after monsoon with worst-case scenario study and critical mineral assessment.
11.	Calculation and values of GHGs (CO_2, CH_4 etc.) emissions during construction and during operation till the life of the project shall be estimated and submitted.
12.	The longitudinal connectivity/Free flowing sketch be provided in the EIA/EMP report.
13.	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.
14.	Conducting site-specific ecological study emphasizing on riverine ecology viz. fishes diversity, fish migration, habitat and aquatic biota due to construction PSP. Impact assessment on the fish diversity based on the hydrological alteration at the water drawing sources shall be studied.
15.	Action plan for survival or diversion of the rivulets/stream, if any, leading to join river shall be submitted.
16.	Impact zone decided prior to base line data generation and accordingly, sampling location shall be finalized. Baseline data as mentioned in Specific ToR shall be collected for preparation of EIA/ EMP report along with soil characteristics which shall be studied at minimum 10 locations. The ground water level at 10 locations shall be measured in project area in all seasons.
17.	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.
18.	Reservoir/ River banks protection plan all along the submergence need to be prepared and incorporated in EIA/ EMP.
19.	Scope of watershed development in the 10 km radius of the project shall be studied in consultation with Indian Council of Agriculture Research (ICAR) Institutes/ Expert Govt. institutions and accordingly a detailed Water Shed Development Plan shall be prepared and incorporated in EIA/ EMP report.
20.	Details of mineral zone, if any, in the study area, certified by Geological Survey of India or any other concerned Government Organization shall be submitted. The project area should not come up on any critical mineral zone, the same shall to be verified by GSI/NMDC.
21.	Any archaeological sites in the vicinity of the project, if any, then it shall be certified by ASI.

22.	Combined Impact of projects proposed in the basin on carrying capacity and sustainability of Reservoir/ River /nala of catchment area due to tapping of water for filling reservoir shall be studied.
23.	The EAC site visit shall be conducted before considering the proposal for grant of Environmental Clearance in view of project location in Western Ghats.

3.1.6.2. Standard

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

11.	Remote Sensing studies, interpretation of satellite imagery, topographic sheets along with ground verification shall be used to develop the land use/land cover pattern of the study using overlaying mapping techniques viz. Geographic Information System (GIS), False Color Composite (FCC) generated from satellite data of project area.
12.	Land details including forests, private and other land.
13.	Demarcation of snow fed and rain fed areas for a realistic estimate of the water availability.
14.	Different riverine habitats like rapids, pools, side pools and variations in the river substratum bedrocks, rocks, boulders, sand/silt or clay etc. need to be covered under the study
Description of Environment and Baseline Data	
1.	To know the present status of environment in the area, baseline data with respect to environmental components air, water, noise, soil, land and biology & biodiversity (flora & fauna), wildlife, socioeconomic status etc. should be collected within 10 km radius of the main components of the project/site i.e. dam site and power house site. The air quality and noise are to be monitored at such locations which are environmentally & ecologically more sensitive in the study area. The baseline studies should be collected for 1 season (Preferably Monsoon season). Flora-Fauna in the catchment and command area should be documented. The study area should comprise of the following:
2.	(i) Catchment area up to the dam/barrage site.
3.	(ii) Submergence Area.
4.	(iii) Project area or the direct impact area should comprise of area within 10 km radius of the main project components like dam, canals etc.
5.	(iv) Downstream upto 10 km from the tip of the reservoir.
Details of the Methology	
1.	The methodology followed for collection of base line data along with details of number of samples and their locations in the map should be included. Study area should be demarcated properly on the appropriate scale map. Sampling sites should be depicted on map for each parameter with proper legends. For Forest Classification, Champion and Seth (1968) methodology should be followed.
Methodology for Collection of Biodiversity Data	
1.	The number of sampling locations should be adequate to get a reasonable idea of the diversity and other attributes of flora and fauna. The guiding principles should be the size of the study area (larger area should have larger number of sampling locations) and inherent diversity at the location, as known from secondary sources (e.g. eastern Himalayan and low altitude sites should have a larger number of sampling locations owing to higher diversity).
2.	The entire area should be divided in grids of 5kmX5km preferably on a GIS domain. There after 25% of the grids should be randomly selected for sampling of which half should be in the directly affected area (grids including project components such as reservoir, dam, powerhouse, tunnel, canal etc.) and the remaining in the rest of the area (areas of influence in 10 km radius form project components). At such chosen location, the size and number of sampling units (e.g. quadrates in case of flora/transects in case of fauna) must be decided by species area curves and the details of the same (graphs and cumulative

	number of species in a tabulated form) should be provided in the EIA report. Some of the grids on the edges may not be completely overlapping with the study area boundaries. However, these should be counted and considered for selecting 25% of the grids. The number of grids to be surveyed may come out as a decimal number (i.e. it has an integral and a fractional part) which should be rounded to the next whole number.
3.	The conventional sampling is likely to miss the presence of rare, endangered and threatened (r.e.t.) species since they often occur in low densities and in case of faunal species are usually secretive in behaviour. Reaching the conclusion about the absence of such species in the study area based on such methodology is misleading. It is very important to document the status of such species owing to their high conservation value. Hence likely presence of such species should be ascertained from secondary sources by a proper literature survey for the said area including referring to field guides which are now available for many taxonomic groups in India. Even literature from studies/surveys in the larger landscapes which include the study area for the concerned project must be referred to, since most species from adjoining catchments is likely to be present in the catchments in question. In fact such literature form the entire state can be referred to. Once a listing of possible r.e.t. species form the said area is developed, species specific methodologies should be adopted to ascertain their presence in the study area which would be far more conclusive as compared to the conventional sampling. If the need be, modern methods like camera trapping can be resorted to, particularly for areas in the eastern Himalayas and for secretive/nocturnal species. A detailed listing of the literature referred to, for developing lists of r.e.t. species should be provided in the EIA reports.The conventional sampling is likely to miss the presence of rare, endangered and threatened (r.e.t.) species since they often occur in low densities and in case of faunal species are usually secretive in behaviour. Reaching the conclusion about the absence of such species in the study area based on such methodology is misleading. It is very important to document the status of such species owing to their high conservation value. Hence likely presence of such species should be ascertained from secondary sources by a proper literature survey for the said area including referring to field guides which are now available for many taxonomic groups in India. Even literature from studies/surveys in the larger landscapes which include the study area for the concerned project must be referred to, since most species from adjoining catchments is likely to be present in the catchments in question. In fact such literature form the entire state can be referred to. Once a listing of possible r.e.t. species form the said area is developed, species specific methodologies should be adopted to ascertain their presence in the study area which would be far more conclusive as compared to the conventional sampling. If the need be, modern methods like camera trapping can be resorted to, particularly for areas in the eastern Himalayas and for secretive/nocturnal species. A detailed listing of the literature referred to, for developing lists of r.e.t. species should be provided in the EIA reports.
4.	The R.E.T. species referred to in this point should include species listed in Schedule I and II of Wildlife (Protection) Act, 1972 and those listed in the red data books (BSI, ZSI and IUCN).
Components of the EIA Study: Various aspects to be studied and provided in the EIA/EMP report are as f ollows:	
1.	null
2.	null
3.	Physical geography, Topography, Regional Geological aspects and structure of the Catchment.
4.	Tectonics, seismicity and history of past earthquakes in the area. A site specific study of the earthquake parameters will be done. The results of the site specific earthquake design shall be sent for approval of the NCSDP (National Committee of Seismic Design Parameters, Central water Commission, New Delhi for large dams.
5.	Landslide zone or area prone to landslide existing in the study area should be examined.

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

22.	Run off, discharge, water availability for the project, sedimentation rate, etc.
23.	Basin characteristics
24.	Catastrophic events like cloud bursts and flash floods, if any, should be documented.
25.	For estimation of Sedimentation Rate, direct sampling of river flow is to be done during the EIA study. The study should be conducted for minimum one year. Actual silt flow rate to be expressed in ha-m km2 year-1.
26.	Set up a G&D monitoring station and a few rain gauge stations in the catchment area for collecting data during the investigation.
27.	Flow series, 10 daily with 90%, 75% and 50% dependable years discharges.
28.	Information on the 10-daily flow basis for the 90 per cent dependable year the flow intercepted at the dam, the flow diverted to the power house and the spill comprising the environmental flow and additional flow towards downstream of the dam for the project may be given.
29.	The minimum environmental flow shall be 20% of the flow of four consecutive lean months of 90% dependable year, 30% of the average monsoon flow. The flow for remaining months shall be in between 20-30%, depending on the site specific requirements. A site specific study shall be carried out by an expert organization.
30.	Sedimentation data available with CWC may be used to find out the loss in storage over the years.
31.	Hydrological studies/data as approved by CWC shall be utilized in the preparation of EIA/EMP report. Actual hydrological annual yield may also be given in the report. Sedimentation data available with CWC may be used to find out the loss in storage over the years.
32.	A minimum of 1 km distance from the tip of the reservoir to the tail race tunnel should be maintained between upstream and downstream projects.
33.	Besides primary studies, review of secondary data/literature published for project area on flora & fauna including RET species shall be reported in EIA/EMP report.
34.	null
35.	Characterization of forest types (as per Champion and Seth method) in the study area and extent of each forest type as per the Forest Working Plan.
36.	Documentation of all plant species i.e. Angiosperm, Gymnosperm, Pteriodophytes, Bryophytes (all groups).
37.	General vegetation profile and floral diversity covering all groups of flora including lichens and orchids. A species wise list may be provided.

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

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

1.	The adverse impact due to the proposed project should be assessed and effective mitigation steps to abate these impacts should be described.
2.	Changes in ambient and ground level concentrations due to total emissions from point, line and area sources.
3.	Effect on soil, material, vegetation and human health.
4.	Impact of emissions from DG set used for power during the construction, if any, on air environment.
5.	Pollution due to fuel combustion in equipments and vehicles
6.	Fugitive emissions from various sources
7.	Changes in surface and ground water quality
8.	Steps to develop pisci-culture and recreational facilities
9.	Changes in hydraulic regime and downstream flow.
10.	Water pollution due to disposal of sewage
11.	Water pollution from labour colonies/ camps and washing equipment.
12.	Adverse impact on land stability, catchment of soil erosion, reservoir sedimentation and spring flow (if any) (a) due to considerable road construction / widening activity (b) interference of reservoir with the inflowing stream (c) blasting for commissioning of HRT, TRT and some other structures.
13.	Changes in land use / land cover and drainage pattern
14.	Immigration of labour population
15.	Quarrying operation and muck disposal
16.	Changes in land quality including effects of waste disposal
17.	River bank and their stability
18.	Impact due to submergence.
19.	Impact on forests, flora, fauna including wildlife, migratory avi-fauna, rare and endangered species, medicinal plants etc.
20.	Pressure on existing natural resources

21.	Deforestation and disturbance to wildlife, habitat fragmentation and wild animal's migratory corridors
22.	Compensatory afforestation-identification of suitable native tree species for compensatory afforestation and green belt.
23.	Impact on fish migration and habitat degradation due to decreased flow of water
24.	Impact on breeding and nesting grounds of animals and fish.
25.	Impact on local community including demographic profile.
26.	Impact on socio-economic status
27.	Impact on economic status.
28.	Impact on human health due to water / vector borne disease
29.	Impact on increase traffic
30.	Impact on Holy Places and Tourism
31.	Impacts of blasting activity during project construction which generally destabilize the land mass and leads to landslides, damage to properties and drying up of natural springs and cause noise population will be studies. Proper record shall be maintained of the baseline information in the post project period.
32.	Positive and negative impacts likely to be accrued due to the project are listed.
Environmental Management Plan	
1.	null
2.	Biodiversity and Wildlife Conservation and Management Plan for the conservation and preservation of rare, endangered or endemic floral/faunal species or some National Park/Sanctuary/ Biosphere Reserve or other protected area is going to get affected directly or indirectly by construction of the project, then suitable conservation measures should be prepared in consultation with the State Forest Department and with the physical and financial details. Suitable conservation techniques (in-situ/ ex-situ) will be proposed under the plan and the areas where such conservation is proposed will be marked on a project layout map.
3.	Compensatory Afforestation shall be prepared by the State Forest Department in lieu of the forest land proposed to be diverted for construction of the project as per the Forest (Conservation) Act, 1980. Choice of plants for afforestation should include native and RET species, if any. This will be a part of the forest clearance proposal.

4.	Fisheries Conservation and Management Plan - a specific fisheries management measures should be prepared for river and reservoir. If the construction of fish ladder/ fish-way etc. is not feasible then measures for reservoir fisheries will be proposed. The plan will detail out the number of hatcheries, nurseries, rearing ponds etc. proposed under the plan with proper drawings. If any migratory fish species is getting affected then the migratory routes, time/season of upstream and downstream migration, spawning grounds etc will be discussed in details.
5.	Green Belt Development Plan along the periphery of the reservoir, approach roads around the colonies and other project components, local plant species must be suggested with physical and financial details. A layout map showing the proposed sites for developing the green belt should be prepared.
6.	Environmental Monitoring Programme to monitor the mitigatory measures implemented at the project site is required will be prepared. Provision for Environment Management Cell should be made. The plan will spell out the aspects required to be monitored, monitoring indicators/parameters with respect to each aspect and the agency responsible for the monitoring of that particular aspect throughout the project implementation.
7.	Catchment Area Treatment (CAT) Plan should be prepared micro-watershed wise. Identification of free draining/ directly draining catchment based upon Remote Sensing and Geographical Information System (GIS) methodology and Sediment Yield Index (SYI) method of AISLUS, Deptt. of Agriculture, Govt. of India coupled with ground survey. Areas or watersheds falling under 'very severe' and 'severe' erosion categories should be provided and required to be treated. Both biological as well as engineering measures should be proposed in consultation with State Forest Department for areas requiring treatment. Year-wise schedule of work and monetary allocation should be provided. Mitigation measures to check shifting cultivation in the catchment area with provision for alternative and better agricultural practices should be included.
8.	Study of Design Earthquake Parameters: A site specific study of earthquake parameters should be done. Results of the site specific earthquake design parameters should be approved by National Committee of Seismic Design Parameters, Central Water Commission (NCSDP), New Delhi.
9.	Dam Break Analysis and Disaster Management Plan The outputs of dam break model should be illustrated with appropriate graphs and maps clearly bringing out the impact of Dam Break scenario. To identify inundation areas, population and structures likely to be affected due to catastrophic floods in the event of dam failure. DMP will be prepared with the help of Dam Break Analysis. Maximum water level that would be attained at various points on the downstream in case of dam break will be marked on a detailed contour map of the downstream area, to show the extent of inundation. The action plan will include Emergency Action and Management plan including measures like preventive action notification, warning procedure and action plan for co-ordination with various authorities.
10.	Reservoir Rim Treatment Plan for stabilization of land slide / land slip zones, if any, around the reservoir periphery is to be prepared based on detailed survey of geology of the reservoir rim area. Suitable engineering and biological measures for treatment of identified slip zones to be suggested with physical and financial schedule. Layout map showing the landslide/landslip zones shall be prepared and appended in the chapter.
11.	Muck Disposal Plan- suitable sites for dumping of excavated material should be identified in consultation with the State Pollution Control Board and Forest Department. All Muck disposal sites should be minimum 30 m away from the HFL of river. Plan for rehabilitation of muck disposal sites should also be given. The L- section/ cross section of muck disposal sites and approach roads to be given. Financial out lay for this may be given separately. Deatailed muck transportation plan delinating the path ways, number of trucks, quantity of muck to be transportated along with monitoring mechanism using latest technology, shall be prepared.
1	Restoration Plan for Quarry Sites and landscaping of colony areas, working areas, roads etc. Details of

2.	the coarse/fine aggregate/clay etc. required for construction of the project and the rock/clay quarries/river shoal sites identified for the project should be discussed along-with the Engineering and Biological measures proposed for their restoration with physical and financial details. Layout map showing quarry sites vis-à-vis other project components, should be prepared.
13.	Resettlement and Rehabilitation Plan needed to be prepared on the basis of findings of the socio-economic survey coupled with the outcome of public consultation held. The R&R package shall be prepared after consultation with the representatives of the project affected families and the State Government. Detailed budgetary estimates are to be provided. Resettlements site should be identified. The plan will also incorporate community development strategies.
14.	Public Health Delivery Plan including the provisions of drinking water supply for local population shall be in the EIA/EMP Report. Status of the existing medical facilities in the project area shall be discussed. Possibilities of strengthening of existing medical facilities, construction of new medical infrastructure etc. will be explored after assessing the need of the labour force and local populace.
15.	Local Area Development Plan to be formulated in consultation with the Revenue Officials and Village Pancahayats. Appropriate schemes shall be prepared under EMP for the Local Area Development Plan with sufficient financial provisions.
16.	Labour Management Plan for their Health and Safety.
17.	Sanitation and Solid waste management plan for domestic waste from colonies and labour camps etc.
18.	Energy Conservation Measures for the work force during construction with physical and financial details. Alternatives will be proposed for the labour force so that the exploitation of the natural resource (wood) for the domestic and commercial use is curbed.
19.	Environmental safeguards during construction activities including Road Construction.
20.	A summary of Cost Estimates for all the plans, cost for implementing all the Environmental Management Plans.
21.	Water, Air and Noise Management Plans to be implemented during construction and post-construction periods.

3.2. Agenda Item No 2:

3.2.1. Details of the proposal

Barnar Reservoir Project in District Jamui, Bihar by **Executive Engineer, Irrigation Division, Jhajha** located at **JAMUI,BIHAR**			
Proposal For		Fresh ToR	
Proposal No	**File No**	**Submission Date**	**Activity Sub-Activity (Schedule Item)**
IA/BR/RIV/569952/2026	J-12011/20/2026-IA.I(R)	03/04/2026	River Valley/Irrigation project

			s Irrigation Projects (1(c))

3.2.2. Project Salient Features

The proposal is for grant of Terms of Reference (TOR) to the project Barnar Reservoir Project (CCA of 22,226 Ha) in an area 1052.43 Ha located at Sub-district Sono, Khaira, and Gidhaur etc., District Jamui, Bihar by M/s M/s Water Resources Department, Bhagalpur, Bihar.

51.7.2 The Project Proponent and the accredited Consultant M/s Rian Enviro Private Limited, made a detailed presentation on the salient features of the project and informed that:

Particular	Latitude	Longitude
Dam Site	24°37'18.53"N	86°19'22.80"E
Left Main Canal end	24°42'53.70"N,	86°11'28.47"E
Right Main Canal end	24°43'16.97"N	86°22'41.89"E

1. Dam structure
2. Left and Right Main canal
3. Pipe distribution network from main canal
4. Housing colony for staffs

Sl no	Project Component	Non-forest land (Ha)	Forest Land (Ha)	Tot
1	Dam Axis	-	3.43	
2	Approach Roads	-	11.26	
3	Dam maintenance	-	16.64	
4	Submergence	-	409.95	
5	Right & Left Main Canals	232.23	10.99	
6	Pipe distribution network*	354.43	5.21	
7	R&R Land	3.80	-	
8	Muck Dumping Yard	3.80	-	
9	Colony (Permanent & Temporary Buildings)	0.70	-	
	Total	**594.96**	**457.48**	

Name of the Proposal	Barnar Reservoir Project in District Jamui, Bihar
Proposal No.	IA/BR/RIV/569952/2026
Location	Sub-district Sono, Khaira, and Gidhaur etc., District Jamui,

(Including Coordinates)	Bihar **Component** / **Latitude** / **Longitude** Dam Site/Canals Starting Points: 24°37'18.53"N, 86°19'22.80" E Ending of Left Main Canal: 24°42'53.70"N, 86°11'28.47" E Ending of Right Main Canal: 24°43'16.97"N, 86°22'41.89" E
Inter- state issue involved	No
Seismic zone	

Category of the project	A
Provisions	Project Activity covered under S.No, 1(c) (ii) (c) Major Irrigation system with applicability of General condition
Capacity / Cultural command area (CCA)	CCA of 22,226 Ha
Attracts the General Conditions (Yes/No)	Yes Bihar-Jharkhand Interstate Boundary ~ 4 km in South from the Dam Site; ~ 400m in South from the Reservoir Boundary
Additional information (if any)	Nil

Cost of project	₹ 257937.85 lakhs
Total area of Project	Culturable Command Area (CCA) of 22,226 Ha
Height of Dam from River Bed (EL)	76.75 m
Length of Tunnel/Channel	
Details of Submergence area	409.95 Ha
Types of Waste and quantity of generation during construction/ Operation	Muck 204824 cum in Bulk Volume
E-Flows for the Project	Will be provided with the EIA/EMP Report
Is Projects earlier studies in Cumulative Impact assessment & Carrying Capacity studies (CIA&CC) for River in which project located. If y	No

es, then a) E-flow with TOR /Recommendation by EAC as per CIA&CC study of River Basin. b) If not the E-Flows maintain criteria for sustaining river ecosystem.	
No. of trees/saplings proposed in view of 'Ek Ped Maa Ke Naam' campaign	Will be provided with EIA/EMP Report

No. of proposed disposal area/ (type of land-Forest/Pvt. land)	
Muck Management Plan	Will be provided with EIA/EMP Report
Monitoring mechanism for Muck Disposal	Will be provided with EIA/EMP Report

Private Land	586.65 Ha
Government land	8.29 Ha
Forest Land	457.48 Ha
Total Land	1052.43 Ha
Submergence area/Reservoir area	409.95 Ha
Additional information (if any)	-

Forest Land/ Protected Area/ Environmental Sensitivity Zone	**Yes/No**	**Details of Certificate / letter/Remarks**
Reserve Forest/Protected Forest Land	Yes	The submergence area is falling under the reserve forest area.
National Park	No	
Wildlife Sanctuary	No	

Details of consultant	Rian Enviro Private Limited, Patna, Bihar NABET Certificate No NABET/EIA/24-27/RA 0368 (Ver. 02) Valid Upto – 11/09/2027 Category-A EIA Consultant Contact Person – Mr Muzaffar Ahmad/ Mr Bhuwan Bhaskar Mobile : 8368193684/7836916696
Project Benefits	The project will help the dry areas of Jamui d

	istricts by providing improved irrigation facili ties, and a portion of the command area may support cultivation during two cropping seas ons.
Status of other statutory clearances	Application for the Forest Clearance submitt ed.
R&R details	Under progress. Will be submitted with EIA/E MP Report
Additional detail (If any)	Nil

3.2.3. Deliberations by the committee in previous meetings

N/A

3.2.4. Deliberations by the EAC in current meetings

53.6.3 The EAC during deliberations noted the following:

- The EAC deliberated on the information submitted (Form 1, PFR, kml file, etc.) and as presented in the meeting and observed that the proposal is for grant of TOR for conducting EIA study for Barnar Reservoir Project (CCA of 22,226 Ha) in an area 1052.43 Ha located at Sub-district Sono, Khaira, and Gidhaur etc., District Jamui, Bihar by M/s M/s Water Resources Department, Bhagalpur, Bihar.

- The EAC noted that the present project proposal comes under "B1" category; as per the provisions of the EIA Notification, 2006, as amended as Culturable Command Area (CCA 22,226 Ha). However, the project is located at proximity to the Bihar–Jharkhand inter-state boundary, it requires appraisal at the Central level by the Expert Appraisal Committee (EAC).
- The Committee took cognizance of the proposal involving construction of a dam near Kataharatand Village with a Culturable Command Area (CCA) of 22,226 hectares and a Gross Command Area (GCA) of 31,781 hectares.
- The EAC deliberated on the proposal and noted that the irrigation project is a long-pending initiative of the Government of Bihar aimed at addressing recurrent drought conditions and flash flood events in the Jamui district caused by highly variable rainfall patterns. The Committee observed that, although the Barnar River is seasonal in nature, the proposed intervention for storage and regulated utilization of monsoon flows is expected to enhance water availability and expand the culturable command area, thereby supporting sustainable agricultural practices.
- The Committee recognized the potential socio-economic benefits of the project, including improved irrigation reliability for Kharif and Rabi crops, increased agricultural productivity, and enhanced livelihood opportunities for the local population. However, the EAC emphasized the need for detailed assessment of hydrological sustainability, downstream flow requirements, and environmental safeguards to ensure minimal ecological impact.
- The EAC noted that the total land required for the project is estimated to be 1052.43 ha. Out of which, 594.96 ha is Non-forest land and 457.48 ha is Forest Land. Diversion of forest land for non-forest purpose will be involved for construction of project components. However, it was observed that the application for Stage-I Forest Clearance (FC) has not yet been submitted, which necessitates further action from the Project Proponent.
- It was further noted that there are No national parks, wildlife sanctuaries, Biosphere Reserves, Tiger/Elephant Reserves, Wildlife Corridors etc. within 10 km distance from the

project site. However, there is occasional Elephant movement is between the Garhi beat of Jamui range, Charkapatthar and Batia beats of Jhaja range and Madhwa sub-beat of Chakai range within 10 km distance from the project site. In view of the presence of Elephant corridor in the submergence area of the proposed project, the EAC opined that PP shall prepare a detailed Wildlife Conservation Plan with specific focus on ensuring safe and unhindered movement of elephants in the landscape. The Plan shall include mitigation measures such as habitat connectivity, avoidance of barrier effects, and monitoring mechanisms, and must be duly approved by the Chief Wildlife Warden.

The EAC based on the information submitted and as presented during the meeting, recommended the proposal for grant of Standard ToR issued by the Ministry for conducting EIA/EMP study with Public consultation for Barnar Reservoir Project (CCA of 22,226 Ha) in an area 1052.43 Ha located at Sub-district Sono, Khaira, and Gidhaur etc., District Jamui, Bihar by M/s M/s Water Resources Department, Bhagalpur, Bihar, under the provisions of EIA Notification, 2006, as amended along with the following additional/specific ToR.

3.2.5. Recommendation of EAC

Recommended

3.2.6. Details of Terms of Reference

3.2.6.1. Specific

Miscellaneous:	
1.	Pre-DPR Chapters viz. Hydrology, Layout Map Studies duly approved by CWC shall be submitted.
2.	PP shall obtain clearance from the inter-State aspect from the designated authorities as per the procedure.
3.	PP shall provide details of acquisition of land for the proposed project as per OM no. 22-76/2014-IA.III dated 07.10.2014.
4.	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.
5.	Both capital and recurring expenditure under EMP shall be submitted.
6.	The photograph should bear the date, time, latitude & longitude of the monitoring station/sampling location. In addition to this PP should submit the original test reports and certificates of the labs which will analyse the samples.
7.	Arial view video of project site shall be recorded and to be submitted.
Muck Management:	
1.	Details of quantity of muck generation component wise and disposal site along with transportation plan and its monitoring to be provided.

2.	Details of Muck Management plan prepared along with estimated cost incorporated in EIA/EMP report.
3.	Techno-economic viability of the project must be recommended from CWC.
Socio-economic Study:	
1.	Public Health Delivery Plan including the provisions of drinking water supply for local population shall be in the EIA/EMP Report. Status of the existing medical facilities in the project area shall be discussed. Possibilities of strengthening of existing medical facilities, construction of new medical infrastructure etc. will be explored after assessing the need of the labour force and local population.
2.	Declaration by the Project Proponent by way of affidavit that "No" Inter-state issue/ policy issue is involved with any State in the project.
3.	All the tasks including conducting public hearing shall be done as per the provisions of EIA Notification, 2006 and as amended from time to time. Public hearing issues raised and compliance of the same shall be incorporated in the EIA/ EMP report in the relevant chapter.
4.	Statement on the commitments (activity-wise) made during public hearing to facilitate the discussion on the CER in compliance of the Ministry's OM F. No. 22- 65/2017- IA.III dated 30th September, 2020 shall be submitted.
5.	Tentative no. of project affected families shall be identified and accordingly appropriate Rehabilitation & Resettlement plan shall be prepared.
6.	Details of settlement in 10 km area shall be submitted
Environmental Management and Biodiversity Conservation:	
1.	A study shall be carried out on impact of project activity on the aquatic and terrestrial ecosystem, within project area classifying the impact zones (highly impact/low impact zone) based on seasonal variations and covering the aspects related to impacts on aquatic ecosystem/ primary productivity due to quantity of water to be lifted and thermal stratification. Accordingly, Environment Management Plan shall be prepared.
2.	Prepare Environmental Cost Benefit Analysis in terms of ecological damage due to diversion of Forest land/ loss of biodiversity and its impacts on ecosystem, water availability, water uses for irrigation in study area (10 km from periphery of Project components).
3.	The habitat fragmentation effects shall be studied in consultation with WII/expert government research institute in terms of edge effects, increased competition, lower biodiversity, human-wildlife conflict and reduced access to resource.
4.	A detailed wildlife conservation plan for Schedule –I species along with mitigation measures for minimizing the human–animal conflict and safe movement of elephants in the identified corridor, duly approved by the Chief Wildlife Warden, be submitted.
5.	Sampling locations be located to cover villages situated near the reservoir and around boundary of forest area for collection of baseline data and data to be incorporated in EIA/EMP report.

6.	Source of construction material and its distance from the project site along with detailed transportation plan for construction material be elaborated in the EIA EMP report. A detailed reclamation/ restoration plan of quarrying site/sites be incorporated in the EIA/EMP report.
7.	In case any wildlife corridor is located within 10 km radius of the project site a detailed study shall be conducted to assess the impact of project on safe movement of wild animals.
8.	Reservoir/ River banks protection plan all along the submergence need to be prepared and incorporated in EIA/ EMP.
9.	Muck disposal site and other components such as Township, site office, Stacking area and batching plant shall be located outside the forest area.
10.	PP shall prepare detailed plan for Plantation of saplings under the tree plantation campaign "Ek Ped Ma Ke Naam".

3.2.6.2. Standard

1(c)	**River Valley/Irrigation projects**
Scope of EIA Study	
1.	The EIA Report should identify the relevant environmental concerns and focus on potential impacts that may change due to the construction of proposed project. Based on the baseline data collected for three (3) seasons (Pre-monsoon, Monsoon and Winter seasons), the status of the existing environment in the area and capacity to bear the impact on this should be analysed. Based on this analysis, the mitigation measures for minimizing the impact shall be suggested in the EIA/EMP study.
Details of the Project and Site	
1.	General introduction about the proposed project.
2.	Details of Project and site giving L-Sections of all U/S and D/S Projects with all relevant maps and figures. Connect such information as to establish the total length of interference of Natural River and the committed unrestricted release from the site of Dam/Barrage into the main river.
3.	A map of boundary of the project site giving details of protected areas in the vicinity of 25 km of project location.
4.	Location details on a map of the project area with contours indicating main project features. The project layout shall be superimposed on a contour map of ground elevation showing main project features (viz. location of dam, Head works, main canal, branch canals, quarrying etc.) shall be depicted in a scaled map.
5.	Layout details and map of the project along with contours with project components clearly marked with proper scale maps of at least 1:50,000 scale and printed at least on A3 scale for clarity.
6.	Existence of National Park, Sanctuary, Biosphere Reserve etc. in the study area, if any, should be detailed and presented on a map with distinct distances from the project components.
7.	Drainage pattern and map of the river catchment up to the proposed project site.

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

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

4.	Physical geography, Topography, Regional Geological aspects and structure of the Catchment.
5.	Tectonics, seismicity and history of past earthquakes in the area. A site specific study of the earthquake parameters will be done. The results of the site specific earthquake design shall be sent for approval of the NCSDP (National Committee of Seismic Design Parameters, Central water Commission, New Delhi for large dams.
6.	Landslide zone or area prone to landslide existing in the study area should be examined.
7.	Presence of important economic mineral deposit, if any.
8.	Justification for location & execution of the project in relation to structural components (dam /barrage height).
9.	Impact of project on geological environment.
10.	null
11.	Meteorology (viz. Temperature, Relative humidity, wind speed/direction etc.) to be collected from nearest IMD station.
12.	Ambient Air Quality with parameters viz. Suspended Particulate Matter (SPM), Respirable Suspended Particulate Matter (RSPM) i.e. suspended particulate materials < 10 microns, Sulphur dioxide (SO2) and Oxides of Nitrogen (NOX) in the study area at 5-6 Locations.
13.	Existing Noise Levels and traffic density in the study area at 5-6 Locations.
14.	null
15.	Soil classification, physical parameters (viz., texture, Porosity, Bulk Density and water holding capacity) and chemical parameters (viz. pH, electrical conductivity, magnesium, calcium, total alkalinity, chlorides, sodium, potassium, organic carbon, available potassium, available phosphorus, SAR, nitrogen and salinity, etc.) at @ one sample/ha of command area.
16.	null
17.	Generation of thematic maps viz, slope map, drainage map, soil map, land use and land cover map, etc. Based on these, thematic maps, an erosion intensity map should be prepared.
18.	New configuration map to be given in the EIA Report
19.	null
20.	History of the ground water table fluctuation in the study area.
2	Water Quality for both surface water and ground water for [i] Physical parameters (pH, Temperature,

1.	Electrical Conductivity, TSS); [ii] Chemical parameters (Alkalinity, Hardness, BOD, COD, NO3, PO4, Cl, So4, Na, K, Ca, Mg, Silica, Oil & grease, phenolic compounds, residual sodium carbonate);[iii] Bacteriological parameter (MPN, Total coliform); and [iv] Heavy Metals (Pb, As, Hg, Cd, Cr6,Total Cr, Cu, Zn, Fe) at minimum10 Locations, however, the sampling numbers should be increased depending on the command area.
22.	Delineation of sub and micro watersheds, their locations and extent based on the Soil and Land Use Survey of India (SLUSOI), Department of Agriculture, Government of India. Erosion levels in each micro-watershed and prioritization of micro-watershed through Silt Yield Index (SYI) method of SLUSOI.
23.	Hydro-Meteorology of the project viz. precipitation (snowfall, rainfall), temperature, relative humidity, etc. Hydro-meteorological studies in the catchment area should be established along-with real time telemetry and data acquisition system for inflows monitoring.
24.	Run off, discharge, water availability for the project, sedimentation rate, etc.
25.	Basin characteristics
26.	Catastrophic events like cloud bursts and flash floods, if any, should be documented.
27.	For estimation of Sedimentation Rate, direct sampling of river flow is to be done during the EIA study. The study should be conducted for minimum one year. Actual silt flow rate to be expressed in ha-m km2 year-1.
28.	Set up a G&D monitoring station and a few rain gauge stations in the catchment area for collecting data during the investigation.
29.	Flow series, 10 daily with 90%, 75% and 50% dependable years discharges.
30.	Environmental flow release should be 20% of the average of the 4 lean months of 90% dependable year during the lean season and 30% of Monsoon flow during monsoon season. For remaining months, the flow shall be decided by the Committee based on the hydrology and available discharge.
31.	A site specific study on minimum environment flow should be carried
32.	null
33.	null
34.	Characterization of forest types (as per Champion and Seth method) in the study area and extent of each forest type as per the Forest Working Plan.
35.	General vegetation profile and floral diversity covering all groups of flora including Bryophytes, Pteridophytes, Lichens and Orchids. A species wise list may be provided.
36.	Assessment of plant species with respect to dominance, density, frequency, abundance, diversity index, similarity index, importance value index [IVI], Shannon Weiner Index etc. of the species to be provided.

	Methodology used for calculating various diversity indices along with details of locations of quadrats, size of quadrats etc. to be reported within the study area in different ecosystems.
37.	Existence of National Park, Sanctuary, Biosphere Reserve etc in the study area, if any, should be detailed.
38.	Economically important species like medicinal plants, timber, fuel wood etc.
39.	Details of endemic species found in the project area.
40.	Flora under RET categories should be documented using International Union for the Conservation of Nature and Natural Resources (IUCN) criteria and Botanical Survey of India's Red Data list along with economic significance. Species diversity curve for RET species should be given.
41.	Fauna study and inventorisation should be carried out for all groups of animals including reptiles and nocturnal animals in the study area. Their present status along with Schedule of the species.
42.	Information (authenticated) on Avi-fauna and wild life in the study area.
43.	Status of avifauna their resident/migratory/ passage migrants etc.
44.	Documentation of butterflies, if any, found in the area.
45.	Details of endemic species found in the project area.
46.	RET species- voucher specimens should be collected along with GPS readings to facilitate rehabilitation. RET faunal species to be classified as per IUCN Red Data list and as per different schedule of Indian Wildlife (Protection) Act, 1972.
47.	Existence of barriers and corridors, if any, for wild animals.
48.	Compensatory afforestation to compensate the green belt area that will be removed, if any, as part of the proposed project development and loss of biodiversity.
49.	For categorization of sub-catchments into various erosion classes and for the consequent CAT plan, the entire catchment (Indian Portion) is to be considered and not only the directly the draining catc
50.	Documentation of aquatic fauna like macro-invertebrates, zooplankton, phytoplanktons, benthos etc.
51.	Fish and fisheries, their migration and breeding grounds.
52.	Fish diversity, composition and maximum length & weight of the measured populations to be studied for estimation of environmental flow.

53.	Conservation status of aquatic fauna.
54.	Cropping pattern and Horticultural practices in the study area.
55.	Collection of primary data on agricultural activity, crop and their productivity and irrigation facilities component.
56.	Component of pressurized/drip irrigation and micro irrigation.
57.	Details of Conjunctive use of water for irrigation
58.	Collection of Baseline data on human settlements, health status of the community and existing infrastructure facilities for social welfare including sources of livelihood, job opportunities and safety and security of workers and surrounding population.
59.	Collection of information with respect to social awareness about the developmental activity in the area and social welfare measures existing and proposed by project proponent.
60.	Collection of information on sensitive habitat of historical, cultural and religious and ecological importance.
61.	The Socio-economic survey/profile within 10 Km of the study area for Demographic profile; Economic Structure; Development Profile; Agricultural Practices; Infrastructure, education facilities; health and sanitation facilities; available communication network etc.
62.	Documentation of Demographic, Ethnographic, Economic structure and development profile of the area
63.	Information on Agricultural practices, Cultural and aesthetic sites, Infrastructure facilities etc
64.	Information on the dependence of the local people on minor forest produce and their cattle grazing rights in the forest land.
65.	List of all the Project Affected Families with their names, education, land holdings, other properties, occupation, source of income, land and other properties to be acquired, etc.
66.	In addition to Socio-economic aspects of the study area, a separate chapter on socio-cultural aspects based upon study on Ethnography of the area should be provided.
Impact Prediction and Mitigation Measures	
1.	The adverse impact due to the proposed project should be assessed and effective mitigation steps to abate these impacts should be described.
2.	Changes in ambient and ground level concentrations due to total emissions from point, line and area sources
3.	Effect on soils, material, vegetation and human health

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

3.	
24.	Impact on breeding and nesting grounds of animal
25.	Impact on local community including demographic profile.
26.	Impact on socio-economic status.
27.	Impact on economic status.
28.	Impact on human health due to water / vector borne disease.
29.	Impact on increases traffic.
30.	Impact on Holy Places and Tourism.
31.	Impacts of blasting activity during project construction which generally destabilize the land mass and lead to landslides, damage to properties and drying up of natural springs and cause noise pollution, will be studied. Proper record shall be maintained of the base line information in the post project period.
32.	Positive as well as negative impacts likely to be accrued due to the project are to be listed.
Environment Impact Analysis	
1.	Environmental Impact Analysis due to the project on the above mentioned components should be carried out for construction and operation phases using qualitative or quantitative methods.
Environmental Management Plan	
1.	Environmental Management Plan aimed at minimizing the negative impacts of the project should be given in detail. The mitigation measures are to be presented for all the likely adverse impacts on the environment. The following suggestive mitigating plans should be included
2.	Biodiversity and Wild Life Conservation & Management Plan for conservation and preservation of endemic, rare and endangered species of flora and fauna to be prepared in consultation with State Forest Department.
3.	Compensatory Afforestation in lieu of the forest land required for the project needs to be proposed.Choice of plants should be made in consultation with State Forest Department including native and RET species, if any.
4.	Fisheries Conservation & Management Plan-Fish fauna inhabiting the affected stretch of river, a specific fisheries management plan should be prepared for river and reservoir.
5.	Plan for Green Belt Development along the periphery of reservoir, colonies, approach road, canals etc. to

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

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

3.3. Agenda Item No 3:

3.3.1. Details of the proposal

Niare Hydro Electric Project (909 MW) by **ANDRA POWER PRIVATE LIMITED** located at **UPPER SUBANSIR I,ARUNACHAL PRADESH**			
Proposal For		Fresh ToR	
Proposal No	**File No**	**Submission Date**	**Activity Sub-Activity (Schedule Item)**
IA/AR/RIV/573804/2026	J-12011/21/2026-IA.I(R)	02/04/2026	River Valley/Irrigation projects RVHEPs without Pump Storage Projects (1(c))

3.3.2. Project Salient Features

The proposal is for grant of Terms of Reference (TOR) to the project Niare Hydro Electric Project (909 MW) in an area of 175.05 Ha located at Sub-district Limeking Circle, District Upper Subansiri, Arunachal Pradesh by M/s Andra Power Private Limited.

52.3.2 The Project Proponent and the accredited Consultant R. S. Envirolink Technologies Private Limited, made a detailed presentation on the salient features of the project and informed that:

- Ø The Project was recommended for grant of TOR during the 11th EAC Meeting held on 06 May 2021.
- Ø TOR was issued by MoEF&CC vide letter dated 04 June 2021 for an installed capacity of 870 MW.
- Ø Post-TOR, Survey & Investigation, DPR preparation, and EIA studies were initiated.
- Ø Land requirement at the time of earlier TOR was 429.585 Ha; revised to 175.05 Ha after layout finalization due to reduction in FRL — a reduction of 254.5 Ha (59%).
- Ø The entire land is categorized as Unclassed State Forest (USF) and private land. A forest diversion application has been filed vide Proposal No. FP/AR/HYD/IRRIG/559610/2025 dated 26 November 2025 for 175.05 Ha.
- Ø An amendment in TOR application was filed vide Proposal No. IA/AR/RIV/571878/2026 dated 17 March 2026; however, since the earlier TOR is expiring on 03 June 2026, a fresh TOR application has been filed.
  - Ø The villages located in and around the project area are small, dispersed, and predominantly dependent on agriculture. Overall population density is lower than the state average.
  - Ø Most residents rely on farming, livestock rearing, fishing, and daily wage labour for their livelihood.
  - Ø Although basic amenities such as primary health centres and schools are available, while advanced medical and higher education facilities are lacking. Road connectivity is poor with limited transport.
  - Ø The major tribes inhabiting the project area include the Tagin, Nyishi, Hill Miri, and Galo communities. These ethnic groups typically reside in small settlements locally known as 'busthi'.
  - Ø The major festivals of the district include Si-Donyi, Boori-Yullo, Boori-Boot, and Mopin, celebrated by the Tagin, Nyishi, Hill Miri, and Galo communities, respectively.
  - Ø Major crops include jhum paddy, maize, soybean, linseed, and mustard, along with fruits like mandarin orange, pineapple, banana, and lemon.

Parameters	Nyare	Limeking H.Q.	Ngus (Orak)	Mepu	Nilo
Households	1	62	11	2	42
Tot	3	37	46	9	24

al Population		6			9
Male Population	0	240	21	5	116
Female Population	3	136	25	4	133
Scheduled Caste (SC) Pop.	0	0	0	0	0
Sc	3	25	46	9	24

heduledTribe(ST)Pop.		0			9

- Limeking HQ is the largest settlement with 62 households with a population of 376, followed by Nilo village with 249 people in 42 households.
- Ngus (Orak) has a moderate population of 46 people across 11 households, whereas Mepu and Nyare are the smallest villages, with populations of 9 and 3 respectively.
- Across all villages, the male and female populations are generally well balanced, except in Limeking HQ, which has 240 males and 136 females' population.
- The presence of Scheduled Caste (SC) communities is negligible across all villages.
- All villages are predominantly inhabited by Scheduled Tribe (ST) populations, except Limeking HQ village, where about 66.48% of the population belongs to Scheduled Tribe communities.
- Straight reach on the upstream as well as downstream of dam axis
- Sufficient width of river valley to accommodate design flood
- Geological & Geotechnical Parameters
- Hydraulic considerations and minimum drawdown level (MDDL) in relation to power intake invert level
- Crest level of Sluice Spillway vis-à-vis power intake level from sediment management consideration
- Narrow gorge on both banks for reducing the length of dam along the axis
- Selection of the dam site based on environmental considerations and forest impacts
- The chosen site offers relatively lower forest density, minimal vegetation loss, and limited impact on local flora and fauna
- Consider the dam site by avoiding reserve forest land requirement, and not fall in wildlife area & its Eco-Sensitive Zone

Description	Alternative-1	Alternative-2	Alternative-3 (Selected)	Alternative-4
Location of Dam axis	D/s of Riyo Siko Nallah (As per PFR NHPC)	800m D/s of Alternative-1 (i.e. 800m U/s of Imisa Siko nallah)	300m D/s of Alternative-2 (i.e. 500m U/s of Imisa Siko nallah)	150m D/s of Alternative-2 (i.e. 650m U/s of Imisa Siko nallah)
S-Bend	140m U/s & 235 D/s	200m U/s	500m U/s	350m U/s

Straight reach available on U/s & D/s	140m & Not available	200m & Available (800m up to confluence)	500m & Available (500m up to confluence)	350m & Available (650m up to confluence)
Dam top length	269m	175.06m	151.36m	209m
Riverbed level	EL.1200m	EL.1168m	EL.1160m	EL.1165m
FRL	EL.1259m	EL.1259m	EL.1259m	EL.1259m
Free Stretch	Not available	Available	Available	Available
No. of total Dam Blocks	18	10	10	12
Functioning of Spillways & Effective sediment management	Not met	Not met	Met	Met
Presence of Nallah at Secondary Powerhouse location	No	No	No	Yes
Left bank Excavation	Less	Large	Less	Large
Construction Time	Require additional time	Require additional time	Can be completed in time	Require additional time
Type of Forest land affected	Unclassed State Forest	Unclassed State Forest	Unclassed State Forest	Unclassed State Forest
Description	Alternative-1	Alternative-2	Alternative-3	Alternative-4
Total Land Requirement	180.5	185	175.05	190

Alternate Study for Powerhouse Site

- Alternative studies have been carried out for locating the powerhouse by keeping the dam at Alternative-3 (FRL at 1259m with the normal TWL of 1051m).
- Three underground alternatives have been studied to minimize the impact on Environment & Forest.
- These sites have been studied in detail and the comparison has been made considering the major aspects of all alternatives and the comparison table is given below:

Particulars	**Alternative-I**	**Alternative-II**	**Alternative-III**
Location of powerhouse	Left Bank Opposite to Muri Village & D/s of Nayaki Siko Nala (0.93km away)	Left Bank Opposite to Orak Village & D/s of Amego Nala (0.45km away)	Left Bank Opposite to Orak Village & D/s of Dapak Karo Sako Nala (0.25km

			away)
Length of Headrace tunnel	2.2Km	3.4km	4.1km
Type of U/s Surge Shaft	Underground Chamb er	Underground Cham ber	Open to Sky
Dimension of Powe rhouse Cavern	151.125m (L) x 23.5m (W) x 55.20m(H)	151.125m (L) x 23.5m (W) x 55.20m(H)	161.125m (L) x 23.5m (W) x 53.60m(H)
Dimension of Trans former cavern	151.125m (L) x 23.5m (W) x 55.20m(H)	151.125m (L) x 16.00m (W) x 32.90m(H)	161.125m(L) x 16m(W) x 28.50m (H)
Dimension of D/s c ollection gallery	118m (L) x 16m (W) x 50m (H)	118m (L) x 16m (W) x 50m (H)	118m (L) x 16m (W) x 50m (H)
Total length of tunn elling	2161.71m	1023m	1023m
Geological strata	Overburden of 35m-40m near Surge	Rock Strata	Rock Strata
	Shaft & Access Adits area		
Presence of Nallahs	No	Yes (Three Nallahs)	Yes (Two Nallahs) – U/s Seasonal 235 m away & 360m a way D/s
Ingress of Water in side the Caverns	No	Yes	No
Total Length of Tail race tunnel	1.82 Km	0.74Km	0.52Km
Construction Time	Require additional ti me	Require additional ti me	Can be completed i n time
Type of Forest Land affected	Unclassed State For est	Unclassed State Fo rest	Unclassed State Fo rest
Total Forest Land re quired	190.45	180.25	175.05

The alternate studies for selecting Dam and Powerhouse site were discussed in detail with CEA, CWC, GSI & CSMRS, and best techno-economical alternative coupled with environmental considerations was selected.

The selected site is not only geologically, technically, economically more viable but also most friendly from environment & forest angle due to following reasons:

- Presents better geological condition due to hard, compact, medium to coarse grained granite gneiss composed of quartz, feldspars, kyanite & sillimanite in the proposed dam complex area.
- There is no evidence of hill slope instability along both abutments, and selected site appears to be geologically stable.
- The dam site has been carefully selected at a location where rock outcrops are exposed on both banks, thereby significantly reducing the requirement of tree felling.
- The reservoir stretch also predominantly covers rocky and sparsely vegetated terrain, minimizing the impact on dense forest cover.
- The major project components such as the powerhouse, head race tunnel (HRT), and switchyard facilities are proposed to be constructed underground, thereby ensuring least possible disturbance to the surface forest area
- The selected site does not require any reserve forest land.
- The selected site located in relatively less forest cover, and as such involves no displacement of families or settlement.
- The selected site does not fall in the 10 Km radius of any wildlife sanctuary/ national park and its Eco-Sensitive Zone.
- The selected site duly incorporates the recommendations made in the already approved Cumulative Impact Assessment (CIA) and Carrying Capacity Studies (CCS) of the Subansiri river basin.

Name of the Proposal	Niare Hydroelectric Project (909 MW)
Proposal No.	IA/AR/RIV/573804/2026
Location (Including Coordinates)	The Niare HE Project is located in upper reaches o f Subansiri River near Orak village. The dam site is located about 4.8 km downstream of the Hari Chu Nallah confluence with Subansiri a t Longitude 93^0 31' 13.45" E and Latitude 28^0 21' 33.87" N. The Powerhouse is located at left bank of Subansir i river near Orak village at Longitude 93^0 32' 48.0 8" E and Latitude 28^0 22' 02.13" N.
Inter- state issue involved	No
Seismic zone	
Category of the project	A
Provisions	Project Activity covered at S.N.1(c)
Capacity / Cultural command area (CC A)	909 MW
Attracts the General Conditions (Yes/N o)	No

Additional information (if any)	No

Powerhouse Installed Capacity	909 MW
Generation of Electricity Annually	3118.87 MU (Main unit) 419.55 MU (Auxiliary)
N	6

o. of Units	(Main PH-4 units; Auxiliary PH-2 units)
Additional information (if any)	

Cost of project	8477.67 Crore
Total area of Project	175.05 Ha (forest land)
Height of Dam from River Bed (EL)	149.50 m
Length of Tunnel/ Channel	4100 m

Details of Submergence area	The submergence area is 48 ha.
Types of Waste and quantity of generation during construction/Operation	Muck from excavation, solid waste from labour colony and construction waste
E-Flows for the Project	E-flow will be released as per applicable guidelines.
Is Projects earlier studies in Cumulative Impact assessment & Carrying Capacity studies (CIA&CC) for River in which project located. If yes, then a) E-flow with TOR /Recommendation by EAC as per CIA&CC study of River Basin. b) If not the E-Flows maintain criteria for sustaining river ecosystem.	Yes As per Cumulative Impact and Carrying Capacity Study (CI&CC) of Subansiri Basin including downstream impacts carried out by CWC in 2015, minimum environmental flow has been considered as 20% of the average flow in monsoon, pre & post monsoon and lean period of 90% dependable year respectively.
No. of trees/saplings proposed in view of 'Ek Ped Maa Ke Naam' campaign	200

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

Private Land	-
Government land	-
Forest Land	175.05 Ha
Total Land	175.05 Ha
Submergence area/Reservoir area	48 Ha
Additional information (if any)	

sForest Land/ Protected Area/ Environmental Sensitivity Zone	**Yes/No**	**Details of Certificate / letter/Remarks**
Reserve Forest/Protected Forest Land	-	No project component falls in any notified protected area. Nearest Protected Nidak Danyi Wildlife Sanctuary is the nearest protected area and is about 70 Km from the project site.
National Park	-	
Wildlife Sanctuary	-	

Particulars	Letter no. and date
Certified EC compliance report (if applicable)	Not Applicable
Status of Stage- I FC	Forest clearance application submitted on 26/11/2025 vide Proposal No. FP/AR/HYD/IRRIG/559610/2025. Accepted in PSC-I and is pending with DFO for Part-II
Additional detail (If any)	NA
Is FRA (2006) done for FC-I	Yes

Particulars	Details
Details of consultant	M/s. R S Envirolink Technologies Pvt. Ltd. (RSET) (*NABET* Accredited *Consultant Organization*) Certificate No : NABET/EIA/25-28/RA0415 Validity : August 15, 2028 Contact Person : Mr. Ravinder Bhatia Name of Sector : River Valley and Hydroelectric Projects Category : A MoEF Schedule : I(C) Address : 402, Radisson Suites Commercial Plaza, B Block, Sushant Lok Phase I, Gurugram, Haryana - 122009. E-mail : ravi@rstechnologies.co.in Land Line : (0124) 4295383 Cellular : (+91) 9810136853
Project Benefits	· Project will generate 3538.42 MU annually in a 90% dependable year. · A number of marginal activities and jobs will be available to the locals during the construction phase. · Local Area Development, facilities in Education, medical, transportation, road network and other infrastructure.
Status of other statutory clearances	Forest Clearance - Online application seeking forest diversion submitted on 26/11/2025 vide Proposal No. FP/AR/HYD/IRRIG/559610/2025. Alongside, other statutory clearances (as applicable) from State as well as Central government will be obtained post completion of Detailed Project Report.

R&R details	The forest land proposed for diversion has b een categorized as Unclassed State Forest. Entire land is also considered as community land, therefore R&R plan will be prepared to compensate for the acquisition of 175.05 ha of land.
Additional detail (If any)	-

3.3.3. Deliberations by the committee in previous meetings

N/A

3.3.4. Deliberations by the EAC in current meetings

53.7.3 The EAC during deliberations noted the following:
The EAC after detailed deliberation on the information submitted and as presented during the meeting **recommended** for grant of Standard ToR for conducting EIA study to the project with Public Consultation for Niare Hydro Electric Project (909 MW) in an area of 175.05 Ha located at Sub-district Limeking Circle, District Upper Subansiri, Arunachal Pradesh by M/s Andra Power Private Limited, under the provisions of EIA Notification, 2006, as amended along with the following additional/specific ToR. The PP shall be responsible for any objections on adverse impacts on the States downstream.

3.3.5. Recommendation of EAC

Recommended

3.3.6. Details of Terms of Reference

3.3.6.1. Specific

Miscellaneous	
1.	Pre-DPR Chapters viz., Hydrology, Layout Map and Power Potential Studies duly appraised by CWC/CEA shall be submitted.
2.	Undertaking need to submitted on affidavit that regarding no activities has been yet started on the project site and water allocated to this scheme shall not be diverted to other purpose.
3.	Both capital and recurring expenditure under EMP shall be submitted.
4.	The 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.

5.	Drone video of project site shall be recorded and to be submitted.
6.	Detailed plan to restore wider roads and convert them into narrow up to 10m after construction of the project.
7.	All the recommendations mentioned in CIA&CSS basin report shall be followed during preparation of EIA/EMP report.
8.	As per Ministry's OM dated 1st August, 2013, PP shall submit application to obtain prior approval of Central Government under the Forest Conservation Act, 1980 for diversion of forest land required for such projects will be submitted as soon as the actual extent of forest land required for the project is known to the project proponent, and in any case, within 6 months of issuance of ToR. However, no proposal will be put up before EAC without submission of application for forest clearance, wherever applicable.
9.	PP shall provide details of acquisition of land for the proposed project as per OM no. 22-76/2014-IA.III dated 07.10.2014.
Disaster Management	
1.	CAT plan, Dam break analysis, Disaster Management Plan and Fisheries Management Plan be prepared along with other EMPs and incorporated in the EIA/EMP report.
2.	Impact of Project activities (specially blasting and drilling) on the aquatic and terrestrial ecosystem, within study area to be studied and be incorporated in EIA/EMP report.
Muck Management	
1.	Details of quantity of muck generation component wise, types of muck (Excavation in tunnels, pressure shaft and powerhouse etc.) and disposal site/ transportation to be provided.
2.	The muck dumping sites shall be located with a distance of 100 mts from HFL. The PP shall submit the detailed action plan for transportation of muck along with monitoring mechanism of movement of muck carrying trucks.
3.	Details of muck management such as dumping sites and its locations, detailing the road map of project construction site/ indicating the distances from HFL, river, project construction site along with types of road etc.
4.	Details of water sprinkling arrangements for arresting the fugitive / dust, emission from transportation and other project activities in project construction area.
5.	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.
6.	Restoration plan for construction area including dumping site of excavated materials by levelling, filling up of burrow pits, landscaping etc.

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

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

3.3.6.2. Standard

1(c)	**River Valley/Irrigation projects**
Scope of EIA Study	

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

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

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

12.	Existing Noise Levels and traffic density in the study area at 5-6 Locations.
13.	null
14.	Soil classification, physical parameters (viz., texture, Porosity, Bulk Density and water holding capacity) and chemical parameters (viz. pH, electrical conductivity, magnesium, calcium, total alkalinity, chlorides, sodium, potassium, organic carbon, available potassium, available phosphorus, SAR, nitrogen and salinity, etc.) at @ one sample/ha of command area.
15.	null
16.	(i) Generation of thematic maps viz, slope map, drainage map, soil map, land use and land cover map, etc. Based on these, thematic maps, an erosion intensity map should be prepared.
17.	null
18.	History of the ground water table fluctuation in the study area.
19.	Water quality for both surface water and ground water for (i) Physical parameters (pH, temperature, electrical conductivity, TSS); (ii) Chemical parameters (Alkalinity, Hardness, BOD, COD, NO2, PO4, Cl, SO4, Na, K, Ca, Mg, Silica, Oil & Grease, phenolic compounds, residual sodium carbonate); (iii) Bacteriological parameter (MPN, Total coliform) and (iv) Heavy Metals (Pb, As, Hg, Cd, Cr-6, total Cr, Cu, Zn, Fe) (6 locations).
20.	Delineation of sub and micro-watersheds, their locations and extent based on the All India Soil and Land Use Survey of India (AISLUS), Department of Agriculture, Government of India. Erosion levels in each micro-watershed and prioritization of micro-watershed through silt yield index (SYI) method of AISLUS
21.	Hydro-Meteorology of the project viz. precipitation (snowfall, rainfall), temperature, relative humidity, etc. Hydro-meteorological studies in the catchment area should be established along-with real time telemetry and data acquisition system for inflows monitoring.
22.	Run off, discharge, water availability for the project, sedimentation rate, etc.
23.	Basin characteristics
24.	Catastrophic events like cloud bursts and flash floods, if any, should be documented.
25.	For estimation of Sedimentation Rate, direct sampling of river flow is to be done during the EIA study. The study should be conducted for minimum one year. Actual silt flow rate to be expressed in ha-m km2 year-1.
26.	Set up a G&D monitoring station and a few rain gauge stations in the catchment area for collecting data during the investigation.
2	Flow series, 10 daily with 90%, 75% and 50% dependable years discharges.

7.	
28.	Information on the 10-daily flow basis for the 90 per cent dependable year the flow intercepted at the dam, the flow diverted to the power house and the spill comprising the environmental flow and additional flow towards downstream of the dam for the project may be given.
29.	The minimum environmental flow shall be 20% of the flow of four consecutive lean months of 90% dependable year, 30% of the average monsoon flow. The flow for remaining months shall be in between 20-30%, depending on the site specific requirements. A site specific study shall be carried out by an expert organization.
30.	Sedimentation data available with CWC may be used to find out the loss in storage over the years.
31.	Hydrological studies/data as approved by CWC shall be utilized in the preparation of EIA/EMP report. Actual hydrological annual yield may also be given in the report. Sedimentation data available with CWC may be used to find out the loss in storage over the years.
32.	A minimum of 1 km distance from the tip of the reservoir to the tail race tunnel should be maintained between upstream and downstream projects.
33.	Besides primary studies, review of secondary data/literature published for project area on flora & fauna including RET species shall be reported in EIA/EMP report.
34.	null
35.	Characterization of forest types (as per Champion and Seth method) in the study area and extent of each forest type as per the Forest Working Plan.
36.	Documentation of all plant species i.e. Angiosperm, Gymnosperm, Pteriodophytes, Bryophytes (all groups).
37.	General vegetation profile and floral diversity covering all groups of flora including lichens and orchids. A species wise list may be provided.
38.	Assessment of plant species with respect to dominance, density, frequency, abundance, diversity index, similarity index, importance value index (IVI) , Shannon Weiner index etc. of the species to be provided. Methodology used for calculating various diversity indices along with details of locations of quadrates, size of quadrates etc. to be reported within the study area in different ecosystems.
39.	Existence of National park, Sanctuary, Biosphere Reserve etc in the study area, if any, should be detailed.
40.	Economically important species like medicinal plants, timber, fuel wood etc.
41.	Details of endemic species found in the project area.
42.	Flora under RET categories should be documented using International Union for the Conservation of Nature and Natural Resources (IUCN) criteria and Botanical Survey of India's Red Data list along-with economic significance. Species diversity curve for RET species should be given.

43.	Cropping pattern and Horticultural Practices in the study area.
44.	null
45.	Fauna study and inventorisation should be carried out for all groups of animals in the study area. Their present status alongwith Schedule of the species.
46.	Documentation of fauna plankton (phyto and zooplankton), periphyton, benthos and fish should be done and analysed.
47.	Information (authenticated) on Avi-fauna and wildlife in the study area.
48.	Status of avifauna their resident/ migratory/ passage migrants etc.
49.	Documentation of butterflies, if any, found in the area.
50.	Details of endemic species found in the project area.
51.	RET species-voucher specimens should be collected along-with GPS readings to facilitate rehabilitation. RET faunal species to be classified as per IUCN Red Data list and as per different schedule of Indian Wildlife (Protection) Act, 1972.
52.	Existence of barriers and corridors, if any, for wild animals.
53.	Compensatory afforestation to compensate the green belt area that will be removed, if any, as part of the proposed project development and loss of biodiversity.
54.	Collection of primary data on agricultural activity, crop and their productivity and irrigation facilities components.
55.	For categorization of sub-catchment into various erosion classes and for the consequent CAT plan, the entire catchment (Indian Portion) is to be considered and not only the directly the draining catchment.
56.	Documentation of aquatic fauna like macro-invertebrates, zooplankton, phytoplantktons, benthos etc.
57.	Fish and fisheries, their migration and breeding grounds.
58.	Fish diversity composition and maximum length & weight of the measured populations to be studies for estimation of environmental flow.
59.	Conservation status of aquatic fauna.
6	Sampling for aquatic ecology and fisheries and fisheries must be conducted during three seasons Pre-

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

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

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

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

	with sufficient financial provisions.
16.	Labour Management Plan for their Health and Safety.
17.	Sanitation and Solid waste management plan for domestic waste from colonies and labour camps etc.
18.	Energy Conservation Measures for the work force during construction with physical and financial details. Alternatives will be proposed for the labour force so that the exploitation of the natural resource (wood) for the domestic and commercial use is curbed.
19.	Environmental safeguards during construction activities including Road Construction.
20.	A summary of Cost Estimates for all the plans, cost for implementing all the Environmental Management Plans.
21.	Water, Air and Noise Management Plans to be implemented during construction and post-construction periods.

4. Any Other Item(s)

N/A

5. List of Attendees

Sr. No.	Name	Designation	Email ID	Remarks
1	Prof G J Chakrapani	Chairman, EAC	cha**********@gmail.com	
2	Dr J V Tyagi	Member (EAC)	jvt******@gmail.com	
3	Shri Kartik Sapre	Member (EAC)	kar********@gmail.com	
4	Shri Ajay Kumar Lal	Member (EAC)	akl****@gmail.com	
5	Dr A K Sahoo	Member (EAC)	ami***@gmail.com	Absent on 29.04.2026
6	Dr Uday Kumar R Y	Member (EAC)	uda********@yahoo.com	
7	Dr J A Johnson	Member (EAC)	jaj@wii.gov.in	
8	Shri Balram Kumar	Member	emo***@nic.in	
9	Shri Rakesh Goyal	Member	goy*********@nic.in	
10	Yogendra Pal Singh	Scientist - F	yog*******@nic.in	

MINUTES OF THE 53RD MEETING OF THE EXPERT APPRAISAL COMMITTEE FOR RIVER VALLEY AND HYDROELECTRIC PROJECTS HELD ON 29TH APRIL AND 30TH APRIL 2026 THROUGH VIRTUAL MODE.

The 53rd meeting of the EAC for River Valley & Hydroelectric Projects organized by the Ministry of Environment, Forest and Climate Change, Indira Paryavaran Bhawan, Jor Bagh Road, New Delhi, was held on 29th April and 30th April, 2026 through Virtual Mode, under the Chairmanship of Prof. G. J. Chakrapani. The list of Members present in the meeting is at **Annexure**.

Confirmation of the Minutes of the 52nd EAC meeting:

The Minutes of the 52nd EAC meeting held on 13th April, 2026 were confirmed.

Agenda Item No. 53.1

Jethala Balancing Reservoir Lift Irrigation Project (CCA of 29000 Ha) in an area of 1242.13Ha located at Sub district Narsinghgarh, Berasia, Huzur and Shyampur, District Sehore and Bhopal, Madhya Pradesh by M/s Water Resources Division, Sehore, Madhya Pradesh – Terms of References (TOR) – reg.

[Proposal No. IA/MP/RIV/572528/2026; F. No. J-12011/17/2026-IA.I(R)]

53.1.1 The proposal is for grant of Terms of Reference (ToR) to the project for Jethala Balancing Reservoir Lift Irrigation Project (CCA of 29000 Ha) in an area of 1242.13Ha located at Sub district Narsinghgarh, Berasia, Huzur and Shyampur, District Sehore and Bhopal, Madhya Pradesh by M/s Water Resources Division, Sehore, Madhya Pradesh.

53.1.2 The Project Proponent and the accredited Consultant M/s Techknowgreen Solutions Limited, Pune, Maharashtra, made a detailed presentation on the salient features of the project and informed that:

i. The Jethala (Balancing Reservoir) Lift Irrigation Project is proposed under Modified Parbati– Kalisindh–Chambal (PKC) Link Project near village Jetla, Tehsil Shyampur, District Sehore, Madhya Pradesh.

ii. The project envisages the construction of a balancing reservoir across a tributary of the Parbati River with a gross storage capacity of 102.76 MCM. The scheme involves lifting water from the submergence of the existing Parbati (Rinsi) Dam and conveying it through a pressurized micro-irrigation network to irrigate a Culturable Command Area (CCA) of 29,000 ha with 100% irrigation intensity by utilizing 94.289MCM of water, along with provision of 1 MCM for domestic water supply.

iii. Water Resources Department, Government of Madhya Pradesh, vide letter dated 31/12/2024, has accorded administrative approval to the Jethala Balancing Reservoir Lift Irrigation Scheme under the Modified Parbati–Kalisindh–Chambal Link Project to irrigate a command area of 29,000 ha.

iv. The project includes construction of a zoned earthen dam of 1,575 m length and 30.91 m height, along with feeder, main and booster pump houses, and an underground pressurized pipe distribution system. Water will be conveyed through rising mains of varying diameters to serve the entire command area. The total installed power requirement for the system is estimated at 23.26 MW. The command area 29,000 Ha. with current cropping intensity of 7,250 Ha. will achieve 100% irrigation intensity after project implementation. The project also envisages fisheries development and provides drinking water benefits to a population of 0.40 Lakhs.

v. **Brief Description of Nature of the Project:** The Jethala Balancing Reservoir Lift Irrigation Project envisages construction of dam (balancing reservoir) of 1575m length and 30.91 maximum height, near Jetla village, tehsil Shyampur, District Sehore across local river; tributary of Parbati river in Parbati sub basin. To irrigate 29000 ha, a pump house (PH-1) is proposed at Parbati river upstream of Parbati Rishri dam keeping the MDDL of pump house at FRL of Parbati Rishri dam. PH-1 will be used as a feeder pump house to feed Jethala balancing reservoir from Parbati river during monsoon season. For this purpose, a MS pipe Line of dia 2.90 m and 10 km length is to be laid from PH-1 to Jethala dam (Balancing Reservoir). Another pump house will be constructed near Jethala Dam (Balancing Reservoir) from which a rising main of maximum 2.7 m diameter MS Pipe to irrigate 24,200 Ha. and another booster pump house is proposed having rising main of 1.3 m diameter MS Pipe to irrigate 4,800 Ha.

The 75% dependable annual yield of Parbati river at lifting point has been recommended to be 964.5 MCM by CWC. The gross storage capacity of Jethala Dam (Balancing Reservoir) is 102.76 MCM which is proposed to provide micro irrigation facility by underground pressurized pipe canal network to an area of 29000 Ha. annually lying in the district of Sehore. The quantity of water to be lifted from the submergence area of the existing Parbati Rinsi Dam is 101MCM. The Jethala Dam (Balancing Reservoir) will also provide 1 MCM of water for drinking water supply benefiting about 40 thousand people.

vi. The proposed dam site is located across Local River tributary of Parbati river near the villageJetla in the Shyampur tehsil located on toposheet No. 55 E/2 in Sehore district of Madhya Pradesh. The latitude and longitude of the dam site are 23°35′00″ N and 77°13′00″ E respectively.

vii. The Jethala Balancing Reservoir Lift Irrigation Project envisages construction of a

balancing reservoir with a gross storage capacity of 102.76 MCM across a tributary of the Parbati River near village Jetla, Tehsil Shyampur, District Sehore, Madhya Pradesh.

viii. **Land requirement:** The proposed Jethala Balancing Reservoir Lift Irrigation Project will involve submergence of land across eight villages, namely Jetla, Kushalpura, Jugrajpura, Lodhipura, Magarda, Mungaoli, Patera and Silkheda. The total non-forest land affected is 1,047.99 ha, while forest land involved is about 194.14 ha. Thus, the total submergence area of the project is approximately 1,242.13 ha.

ix. **Water requirement:** About 101 MCM of water will be lifted from the submergence area of the existing Parbati Rinsi Dam. The total water requirement for irrigation is 94.289 MCM and domestic purpose is 1MCM.

x. **Project Cost**: The estimated project cost is Rs ₹ 1349.51 crore; The proposal have been submitted at the Central Water Commission on 02/12/2026 on e-pams portals for obtaining approval on the revised project cost of Rs. 155627.86 lakhs; the approval is awaited.

xi. **Project Benefit:**

1) Provision of Irrigation Benefits to a command area of 29,000 Ha. at 100% irrigation intensity to a total 113 villages in the water - deficit region of Sehore District
2) Provision of 1 MCM drinking water supply benefiting 40 thousand people
3) Opportunities for fisheries development - 308.99 tonnes of fish production per year
4) Improvement in the socio-economic development and livelihood of the inhabitants
5) Social infrastructure development as a part of local Area development Plan under CER
6) Improvement in the micro-climatic conditions of the region through greenbelt development
7) Employment opportunities during construction and operational phase of the project

xii. **Environmental Sensitive area:** There are no National Parks, Biosphere Reserves, Tiger/Elephant Reserves or Wildlife Corridors within 10 km of the project site; however, the feeder pump house located on the Parbati river lies at a distance of 1.27Km from Narsinghgarh Wildlife Sanctuary. The feeder Pump House and the Northen portion of the command area falls in the Narsinghgarh Wildlife Sanctuary Eco-Sensitive Zone. River/water body Parbati River is flowing at distance of 0km from the feeder pump house.

xiii. **MoU / any other clearance/ permission signed with State government:** The MoU and MoA for this Jethala Balancing Reservoir Lift Irrigation Scheme was signed

between Madhya Pradesh, Rajasthan and Central Government on 28th January, 2024 and 05th December, 2024, respectively.

xiv. **Resettlement and rehabilitation:**

Total Private Land Acquisition: 819.16 Ha across 9 villages
Submergence Area: 817.16 Ha across 7 villages
•Jetla
•Kushalpura
•Lodhipura
•Magarda
•Mungaoli
•Patera
Land for Project Components:
•Gawa: 1 Ha (PH-2)
•Barkheda Kharet: 1 Ha (Booster Pump House)
The survey for project affected families/ properties is currently under progress and the details of the same shall be included in the EIA report

xv. **Alternative Studies:** The reservoir site was selected based on contour map analysis, identifying the location with the maximum feasible storage capacity. The command area has been delineated in a site-specific manner to address water-deficit regions of Sehore district, enabling both irrigation and domestic water supply through a micro-irrigation distribution system.

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

Waste Type	Quantity	Source	Management Method
Biodegradable waste	71.46 kg/day	Labour camps	Composting through Gram Panchayat / ULB
Non-biodegradable waste	47.64 kg/day	Construction activities	Authorised recyclers / disposal as per SWM Rules, 2016
Plastic waste (cement bags)	0.71 TPA	Construction activities	Collection and disposal through authorised recyclers
Used / Spent oil (Hazardous)	18.35 litres/annum	DG sets	Stored in designated containers and disposed through authorised recyclers

Muck	7,33,855.38 m³,	Excavation	Reused in construction activities

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

xviii. The salient features of the Jethala Balancing Reservoir Lift Irrigation Project dare as under :-

- **Project Details**

Name of the Proposal	Environmental Clearance for Jethala Balancing Reservoir Lift Irrigation Project having CCA of 29000 Ha., District: Sehore, State: Madhya Pradesh by Water Resources Division, Sehore, Madhya Pradesh
Location (Including coordinates)	Village: Jetla, Tehsil: Shyampur District: Sehore State: Madhya Pradesh Latitude: 23° 34’ 31.14” N, Longitude: 77° 13’ 1.7” E
Inter- state issue involved	No
Seismic zone	Zone II

- **Category of details**

Category of the project	A
Provisions	The project falls under Major Irrigation System (≥ 10,000Ha.), under (ii) Irrigation projects of 1 (c) River Valley as per the Environmental Impact Assessment (EIA) Notification, 2006 and its subsequent amendment dated 20th April, 2022.
Capacity / Cultural command area (CCA)	29,000
Attracts the General Conditions (Yes/No)	Yes
Additional information (if any)	Presence of Narsinghgarh Wildlife Sanctuary and its Eco-Sensitive

	Zone within the 10km radial distance from the project site

- **ToR/EC Details**

Cost of project	Approved cost : 1349.51 crore; Further, the proposal have been submitted at the Central Water Comission on 02/12/2026 on e-pams portals for obtaining approval on the revised project cost of Rs. 155627.86 lakhs; the approval is awaited.
Total area of Project	Land requirement : 1,242.13 Ha.
Height of Dam from River Bed (EL)	NA
Length of Tunnel/Channel	Not any
Details of Submergence area	1242.13 Ha.
Types of Waste and quantity of generation during construction/ Operation	Construction Phase: Muck: 7,33,855.38 Cu.m. Wastewater: 14.29 KLD Solid waste: — Biodegradable waste: 71.46 Kg/day — Non Biodegradable waste: 47.64 Kg/day — Plastic waste (cement bags): 0.71 TPA Used/Spent Oil from DG set: 18.35 Litres/year
E-Flows for the Project	Provision of two sluices at RD 255 m and RD 465 m has been made in the earthen Jethala dam (Balancing Reservoir) for environmental flow release and emergency depletion of the reservoir.
Is Projects earlier studies in Cumulative Impact assessment & Carrying Capacity studies (CIA&CC) for River in which project located. If yes, then a) E-flow with TOR /Recommendation by EAC as per CIA&CC study of River Basin. b) If not the E-Flows maintain criteria for	No

sustaining river ecosystem.	

- **Muck Management Details:**

No. of proposed disposal area/(type of land- Forest/Pvt. land)	Not any
Muck Management Plan	• Total muck generated : 7,33,855.38 Cu.m. • The total quantity of Hard soil/ Hard murum (4,70,856.67 Cu.m.) and Hard rock (65749.68 Cu.m.) generated will be utilized for construction activity • The remaining quantity of muck i.e. 1,97,249.03 Cu.m. of D.R./S.R. will be utilized for road development.
Monitoring mechanism for Muck Disposal	All the muck generated will be utilized

- **Land Area Breakup**

Private land	817.16 Ha
Government land	230.83 Ha
Forest Land	194.14 Ha
Total Land	1242.13 Ha
Submergence area/Reservoir area	1242.13 Ha
Additional information (if any)	-

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

Forest Land/ Protected Area/ Environmental Sensitivity Zone	**Yes/No**	**Details of Certificate/letter/Remarks**
Reserve Forest/Protected Forest Land	Yes	• RF near Lodhipura Village at a distance of 0.3km (NNE) from Jethla Dam submergence area • Protected Forest near Chanderi village at a distance of 1.8Km (ESE) from the Command Boundary • Narsinghgarh Wildlife Sanctuary at a distance of 1.27Km (NW) from the feeder pump house
National Park	No	
Wildlife Sanctuary	Yes	

- **Court case details: Nil**

- **Previous EC compliance and necessary approvals**

Particulars	**Letter no. and date**
Certified EC compliance report (if applicable)	NA
Status of Stage- I FC	Submission of application for obtaining Forest Clearance for 194.14Ha. of forest land is under process.
Additional detail (If any)	The MoU and MoA for this Jethala Balancing Reservoir Lift Irrigation Scheme was signed between Madhya Pradesh, Rajasthan and Central Government on 28th January, 2024 and 05th December, 2024, respectively.
Is FRA (2006) done for FC-I	

- **Miscellaneous**

Particulars	**Details**
Details of consultant	Techknowgreen Solutions Limited Address: 202, Hem Opal, Ekta Park Society, Wakdewadi, Shivaji nagar, Pune, Maharashtra- 411005. NABET Accreditation: NABET/EIA/24-27/SA 0271; Valid up to July 05, 2027
Project Benefits	1) Provision of Irrigation Benefits to a command area of 29,000 Ha. at 100% irrigation intensity to a total 113 villages in the water - deficit region of Sehore District 2) Provision of 1 MCM drinking water 3) Opportunities for fisheries development - 308.99 tonnes of fish production per year 4) Improvement in the socio-economic development and livelihood of the inhabitants 5) Social infrastructure development as a part of local Area development Plan under CER 6) Improvement in the micro-climatic conditions of the region through greenbelt development 7) Employment opportunities during construction and operational phase of the project
Status of other statutory clearances	Submission of application for obtaining Forest Clearance for 194.14Ha. of forest land is under process.
R&R details	**Total Private Land Acquisition:** 819.16 Ha across 9

	villages **Submergence Area:** 817.16 Ha across 7 villages • Jetla • Kushalpura • Lodhipura • Magarda • Mungaoli • Patera **Land for Project Components:** • Gawa: 1 Ha (PH-2) • Barkheda Kharet: 1 Ha (Booster Pump House) The survey for project affected families/ properties is currently under progress and the details of the same shall be included in the EIA report.
Additional detail (If any)	

53.1.3 The EAC during deliberations noted the following:

- The EAC deliberated on the information submitted (Form 1, PFR, kml file, etc.) and as presented in the meeting and observed that the proposal is for grant of TOR for conducting EIA study for Jethala Balancing Reservoir Lift Irrigation Project (CCA of 29000 Ha) in an area of 1242.13Ha located at Sub district Narsinghgarh, Berasia, Huzur and Shyampur, District Sehore and Bhopal, Madhya Pradesh by M/s Water Resources Division, Sehore, Madhya Pradesh.

- The EAC noted that the present project proposal comes under "B1" category; as per the provisions of the EIA Notification, 2006, as amended as Culturable Command Area (CCA 29,000 ha). However, the project components are falling in the Narsinghgarh Wildlife Sanctuary Eco-Sensitive Zone hence, it requires appraisal at the Central level by the Expert Appraisal Committee (EAC).

- The EAC observed that the Jethala (Balancing Reservoir) Lift Irrigation Project is proposed under Modified Parbati– Kalisindh–Chambal (PKC) Link Project near village Jetla, Tehsil Shyampur, District Sehore, Madhya Pradesh. The proposed project envisages construction of a balancing reservoir with a gross storage capacity of 102.76 MCM across a tributary of the Parbati River. The scheme involves lifting water from the submergence of the existing Parbati (Rinsi) Dam and conveying it through a pressurized micro-irrigation network to irrigate a Culturable Command Area (CCA) of 29,000 ha with 100% irrigation intensity by utilizing 94.289MCM of water, along with provision of 1 MCM for domestic water supply.

- The EAC noted that the total land required for the project is estimated to be 1,242.13 ha. Out of which, non-forest land affected is 1,047.99 ha (private land is 817.16 Ha and

government Land is 230.83 Ha) and forest land involved is about 194.14 ha. Diversion of forest land for non-forest purpose will be involved for construction of project components. Further, it was observed that the application for Stage-I Forest Clearance (FC) has been submitted on 18/02/2026 vide proposal no. FP/MP/HYD/IRRIG/569550/2026.

- The EAC noted with concern that the feeder Pump House and the Northern portion of the command area falls in the Narsinghgarh Wildlife Sanctuary Eco-Sensitive Zone. The Ministry of Environment, Forest and Climate Change vide Notification S.O. 3689(E) dated 27th July, 2018 has notified the Eco-Sensitive Zone (ESZ) around the sanctuary, wherein a monitoring committee has been constituted for effective monitoring of the Eco-Sensitive Zone. It is inter-alia mentioned in the ESZ notification that the activities that are covered in the Schedule to the notification of the Government of India in the erstwhile Ministry of Environment and Forests number S.O. 1533(E), dated the 14th September, 2006, and are falling in the Eco-sensitive Zone, except for the prohibited activities as specified in Table under paragraph 4 thereof, shall be scrutinised by the Monitoring Committee based on the actual site-specific conditions and referred to the Central Government in the Ministry of Environment, Forest and Climate Change for prior environmental clearances under the provisions of the said notification.

- In view of the above, the EAC opined that the Project Proponent should submit recommendations of the above-mentioned Monitoring Committee before taking any decision on the proposal by the EAC.

53.1.4 The EAC based on the information submitted and as presented during the meeting, and in view of the above provisions and regulatory restrictions, decided to ***defer*** the proposal for grant of Terms of Reference for conducting EIA study for proposed construction of Jethala Balancing Reservoir Lift Irrigation Project (CCA of 29000 Ha) in an area of 1242.13Ha located at Sub district Narsinghgarh, Berasia, Huzur and Shyampur, District Sehore and Bhopal, Madhya Pradesh by M/s Water Resources Division, Sehore, Madhya Pradesh.

The proposal was ***deferred*** on the following point.

1. The Project Proponent shall obtain comments/observations of the Monitoring Committee constituted vide Notification S.O. 3689(E) dated 27th July, 2018 for Narsinghgarh Wildlife Sanctuary Eco-Sensitive Zone.

<u>Agenda Item No. 53.2</u>

Bodwad Parisar Sinchan Yojana (CCA of 53,025 Ha) in an area of 1315.13Ha located at Sub District Jamner, Motala, Muktainagar (Edlabad), Malkapur and Bodvad, District

Jalgaon and Buldana, Maharashtra by M/s Tapi Irrigation Development Corporation, Jalgaon – Terms of References (TOR) – reg.

[Proposal No. IA/MH/RIV/572754/2026; F. No. J-12011/12/2026-IA.I (R)]

53.2.1 The proposal is for grant of Terms of Reference (ToR) to the project for Bodwad Parisar Sinchan Yojana (CCA of 53,025 Ha) in an area of 1315.13 Ha located at Sub District Jamner, Motala, Muktainagar (Edlabad), Malkapur and Bodvad, District Jalgaon and Buldana, Maharashtra by M/s Tapi Irrigation Development Corporation, Jalgaon.

53.2.2 The Project Proponent and the accredited Consultant M/s Techknowgreen Solutions Limited, Pune, Maharashtra, made a detailed presentation on the salient features of the project and
informed that:

i. The Bodwad Parisar Sinchan Yojana is proposed for development in the Tapi River Basin within Jalgaon District of Maharashtra. The project envisages lifting a total of 198.54 Mcum (7.01 TCM) of monsoon floodwater flowing from the submergence area of Hatnur Dam near Khamkheda Bridge close to Muktainagar village on the Purna River and store the lifted water in the proposed storage reservoirs, namely Junone and Jamthi.

ii. Tapi Irrigation Development Corporation, Jalgaon, Govt. of Maharashtra vide Order No. तापीपावि/का.सं/.बोदिड/तृतीय सुधारित/०२/२०२२ dated 20/04/2022 accorded third revised administrative approval to the Bodwad Parisar Sinchan Yojana as per the 2018–19 Schedule of Rates, with a sanctioned cost of ₹3,763.60 crore for the Irrigable Command Area of 42,420 Ha. and Irrigation Potential of 53,449 Ha .

iii. A total of 197.574 Mcum of water will be utilized to irrigate a total Irrigable Command Area (ICA) of 42,420 hectares, with a Culturable Command Area (CCA) of 53,025 hectares and an Ultimate Irrigation Potential (UIP) of 53,449 hectares. On completion, the scheme will provide assured irrigation benefits to 101 villages constituting 63 villages in Jalgaon District and 38 villages in Buldhana District. In Jalgaon District, the notified command area of 26,811 hectares is distributed across Bodwad (18,574 ha), Jamner (6,339 ha), and Muktainagar (1,897 ha) talukas. In Buldhana District, a total notified command area of 15,610 hectares is proposed to be served through Malkapur (8,035 ha) and Motala (7,575 ha) talukas.

iv. The scheme is proposed to be implemented in two stages;

Stage–I (Junone Reservoir): gross storage capacity of 120.78MCM, water will be lifted from the Purna River in two stages by pumping and conveyed to the Junone reservoir through two rows of rising mains of 2,500 mm diameter, total water utilisation of 148.342 MCM to serve an irrigable command area of 32,540 hectares, with a cultivable command

area of 40,675 hectares and an ultimate irrigation potential of 41,000 hectares.

Stage–II (Jamthi Reservoir): gross storage capacity of 42.91 MCM, water is proposed to be lifted from the distribution tank of the Junone Dam and conveyed to the Jamthi reservoir through two rows of rising mains of 1,850 mm diameter, total water utilization of 49.232 MCM to irrigate an area of 9,880 hectares, with a Cultivable Command Area of 12,350 hectares and an ultimate irrigation potential of 12,449 hectares.

v. The existing crop pattern in the command area is predominantly rainfed, with Kharif crops occupying the majority of the cultivated area having a net agricultural income of ₹15,315.91 lakh under pre-irrigation conditions. Whereas, under post-project irrigated conditions, adoption of a diversified and high-intensity cropping pattern with a greater share of perennial, vegetable, and Rabi crops have been proposed, thereby, increasing the cropping intensity to 146% with a net agricultural income of ₹1,15,773.12.

vi. This project is a joint project of the Vidarbha Irrigation Development Corporation (VIDC) and the Tapi Irrigation Development Corporation (TIDC). Of the total I.C.A. of 42,420Ha., 15,699 Ha. pertain to the balance command area in Buldhana District under Vidarbha Irrigation Development Corporation, and 26,721 hectares pertain to Jalgaon District under Tapi Irrigation Development Corporation. In the total project cost, the share of VIDC is 37%, while the share of TIDC is 63%.

vii. The geographical co-ordinate of the project are:

- Junone Dam: 20^0 57' 00"N, 76^0 00' 00"E
- Jamthi Dam: 20^0 49' 00"N, 75^0 58' 30"E

viii. Ministry had issued Environmental Clearance earlier vide letter no. J-12011/3/2009-IA.I dated 19/04/2010 to the existing project Bodwad Parisar Sinchan Yojana in favour of M/s. Design Divisional Unit, Tapi Irrigation Development Corporation.

ix. **Land requirement:**

Type	Stage-I	Stage-II
Private	16.10	626.80
Govt.	5.25	40.95
Forest Land	626.03	-
Total	**647.38**	**667.75**

x. **Water requirement:** A total of 198.54 Mcum will be lifted from the bank of the Purna river and the proposed water utilization is 197.574Mcum

xi. **Project Cost:** The estimated project cost is Rs. 3763.60 Crores including existing investment of Rs. 1,508.23 crores.

xii. **Project Benefit:**

1) Irrigation benefits to a command area of 42,420 Ha. across 101 villages in the water-deficit region of Jalgaon and Buldhana districts.
2) Cropping intensity of 146% will be achieved
3) Improvement in the socio-economic development and livelihood of the inhabitants
4) Social infrastructure development as a part of local Area development Plan under CER
5) Improvement in the micro-climatic conditions of the region through greenbelt development
6) Employment opportunities during construction and operational phase of the project

xiii. **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. River/ water body Purna river is flowing at a distance of 0.12km from 1A Pump House in North direction.

xiv. **MoU / any other clearance/ permission signed with State government:**

- Central Water Commission vide letter dated 29/03/2011 granted approval to the Bodwad Area Irrigiation Scheme.
- Stage–I of the project was included under PMKSY based on CWC decision dated 12/09/2022, with formal approval by Ministry of Jal Shakti vide letter No. P-19011/14/2022-O/o-SJC (SPR-II)-MOWR/3500-13 dated 06/12/2023.
- The Project received original administrative approval in September 1999, i.e., prior to the enactment of the Maharashtra Water Resources Regulatory Authority (MWRRA) Act, 2005.
- Vidarbha Irrigation Development Corporation approved the project as a joint project (37% command area in Buldhana) vide letter No. 2066/VIPAVIM/Ka.Tan.-3/9/2008 dated 06/05/2008, permitting Tapi Irrigation Development Corporation to execute the works.

xv. **Resettlement and rehabilitation:** No gaothan (village habitation) is affected, either fully or partially. Land will be acquired as per the Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement (RFCTLARR) Act, 2013.

xvi. **Alternative Studies**:

For Stage–I (Junone Lift Irrigation Scheme) of the Bodwad Parisar Sinchan Yojana, alternative dam sites near Junone, Amadgaon and Ghodasgaon were evaluated based on techno-economic and environmental considerations such as foundation conditions, dam and pipeline length, material availability, infrastructure, submergence area, and impact on agricultural and forest land. Although the scheme was initially proposed at Junone, the Amadgaon site was finalized as the most suitable option due to its favorable bowl-shaped topography enabling efficient storage of 120.78 Mcum with relatively lower submergence (624 ha), availability of better foundation strata at shallow depth, and comparatively lesser forest land involvement.

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

Component	Quantity	Management Plan
Wastewater (Construction Phase)	34.24 KLD	Treated through mobile STPs
Biodegradable Solid Waste	171.36 kg/day	Segregated and handed over to local authority for composting
Non-Biodegradable Solid Waste	114.24 kg/day	Segregated and disposed through authorized recyclers/municipal facilities
Plastic Waste (Cement Bags)	6.5675 TPA	Collected separately and sent to CPCB/SPCB authorized recyclers
Hazardous Waste (Used Oil from DG Set)	22.35 Litres/year	Stored in designated containers and disposed through authorized recyclers
Muck Generation	1,00,15,547.27 m^3	88,91,139.05 m^3 reused in backfilling; balance 11,24,408.22 m^3 used for land levelling, road works & site development

xviii. Status of Litigation Pending against the proposal, if any. NO

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

- **Project Details**

Name of the Proposal	Environmental Clearance for Bodwad Parisar Sinchan Yojana at Taluka Bodwad, District Jalgaon, Maharashtra by Tapi Irrigation Development Corporation, Jalgaon
Location (Including coordinates)	Village: Muktainagar, District: Jalgaon, State: Maharashtra Junone Dam: 20^{0} 57' 00"N, 76^{0} 00' 00"E Jamthi Dam: 20^{0} 49' 00"N, 75^{0} 58' 30"E
Inter- state issue involved	No
Seismic zone	Zone II and Zone III

- **Category of details**

Category of the project	A
Provisions	The project falls under Major Irrigation System (> 10,000Ha.), under (ii) Irrigation projects of 1 (c) River Valley as per the Environmental Impact Assessment (EIA) Notification, 2006 and its subsequent amendment dated 20th April, 2022.
Capacity / Cultural command area (CCA)	53,025 Ha.
Attracts the General Conditions (Yes/No)	Yes
Additional information (if any)	The Maharashtra-Madhya Pradesh Interstate boundary lies at a distance of 9.20Km north-east side from Stage-IA Pump House located on the Purna river.

- **ToR/EC Details**

Cost of project	₹ 3,763.60 crore
Total area of Project	Land requirement - 1315.13 Ha
Height of Dam from River Bed (EL)	Junone Dam : 46.90m; Jamthi Dam : 27.85m
Length of Tunnel/Channel	Not any
Details of Submergence area	Junone Dam: 524 Ha.; Jamthi Dam: 667.75 Ha.
Types of Waste and quantity of generation during construction/ Operation	Construction Phase: Muck: 1,00,15,547.27Cu.m. Wastewater: 34.24 KLD Solid waste:

	— Biodegradable waste : 171.36Kg/day — Non-biodegradable waste: 114.24 Kg/day — Plastic waste (cement bags): 6.5675 TPA Used/Spent Oil from DG set: 22.35 Litres/year
E-Flows for the Project	NA
Is Projects earlier studies in Cumulative Impact assessment & Carrying Capacity studies (CIA&CC) for River in which project located. If yes, then a) E-flow with TOR /Recommendation by EAC as per CIA&CC study of River Basin. b) If not the E-Flows maintain criteria for sustaining river ecosystem.	No

- **Muck Management Details**

No. of proposed disposal area/(type of land-Forest/Pvt. land)	NA
Muck Management Plan	• Total muck generated: 1,00,15,547.27 m³ due to excavation for components such as pump houses, jackwell, intake structures, rising mains, and distribution network • Muck reused for backfilling: 88,91,139.05 m³ i.e. 88.77% • The remaining 11,24,408.22 m³ of muck will be utilized for land leveling, road works, and site development etc.
Monitoring mechanism for Muck Disposal	NA

- **Land Area Breakup**

Private land	642.9
Government land	46.2
Forest Land	626.03
Total Land	1315.13
Submergence area/Reservoir area	Junone Dam: 524Ha.; Jamthi Dam: 667.75Ha.
Additional information (if any)	-

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

Forest Land/ Protected Area/ Environmental Sensitivity Zone	**Yes/No**	**Details of Certificate/letter/Remarks**
Reserve Forest/Protected Forest Land	Yes	Reserve Forest near Amadgaon
National Park	No	
Wildlife Sanctuary	No	

- **Court case details**:NIL

- **Previous EC compliance and necessary approvals**

Particulars	**Letter no. and date**
Certified EC compliance report	Submitted request letter to RO, Nagpur for Certified Compliance Report
Status of Stage- I FC	**<u>For Forest Land of 507.31Ha.</u>** • MoEF, GoI vide letter F. No. 8-50/2001-FC/2544 dated 17/07/2001 accorded Stage-I FC; • Further, MoEF, GoI vide letter No. F-8-50/2001-FC dated 11/03/2002 accorded Stage-II FC for 507.31 Ha for forest land. **<u>For Forest Land of 118.72Ha.</u>** • The application for obtaining Forest clearance for additional 118.72 Ha. of forest land have been submitted on the Parivesh Portal vide Proposal No. FP/MH/HYD/IRRIG/537001/2025 dated 09/05/2025 • The Deputy Superintendent of Land Records, Yawal, has scheduled the boundary demarcation survey on 10/12/2025 and 11/12/2025. • At present boundary demarcation process is in progress.
Additional detail (If any)	• MoEF, GoI vide letter dated 19/04/2010 accorded Environmental Clearance (EC) to the Bodwad Parisar Sinchan Yojana with validity up to April 2020. • MoEF&CC, GoI vide letter dated

	23/06/2020 accorded extension to the validity of EC up to 18/04/2023 • As per MoEF&CC Notification S.O. 221(E) dated 18/01/2021, the period from 01/04/2020 to 31/03/2021 was excluded, extending the EC validity up to 18/04/2024. • Further, MoEF&CC, GoI vide letter dated 07/05/2024, extended the EC validity for an additional 2 years up to 18/04/2026.
Is FRA (2006) done for FC-I	

- **Miscellaneous**

Particulars	**Details**
Details of consultant	Techknowgreen Solutions Limited, Pune NABET Accreditation : NABET/EIA/24-27/RA 0364; Valid up to July 05, 2027
Project Benefits	1) Irrigation benefits to a command area of 42,420 Ha. across 101 villages in the water-deficit region of Jalgaon and Buldhana districts. 2) Cropping intensity of 146% will be achieved 3) Improvement in the socio-economic development and livelihood of the inhabitants 4) Social infrastructure development as a part of local Area development Plan under CER 5) Improvement in the micro-climatic conditions of the region through greenbelt development 6) Employment opportunities during construction and operational phase of the project
Status of other statutory clearances	• Central Water Commission vide letter dated 29/03/2011 granted approval to the Bodwad Area Irrigiation Scheme. • Maharashtra Pollution Control Board granted Consent to Establish to Tapi Irrigation Development Corporation vide Consent No. BO/RO (P&P)/EIC No. NK-3698-09/CC-289 dated 28/08/2009 under the Water Act, 1974, Air Act, 1981, and Hazardous Waste Rules (1989 & amendments).

R&R details	No gaothan (village habitation) is affected, either fully or partially.
Additional detail (If any)	

53.2.3 The EAC during deliberations noted the following:

- The EAC deliberated on the information submitted (Form 1, PFR, kml file, etc.) and as presented in the meeting and observed that the proposal is for grant of TOR for conducting EIA study for Bodwad Parisar Sinchan Yojana (CCA of 53,025 Ha) in an area of 1315.13Ha located at Sub District Jamner, Motala, Muktainagar (Edlabad), Malkapur and Bodvad, District Jalgaon and Buldana, Maharashtra by M/s Tapi Irrigation Development Corporation, Jalgaon.

- The EAC noted that the Ministry vide letter No. J-12011/3/2009-IA.I dated 19/04/2010 accorded Environmental Clearance to the Bodwad Parisar Sinchan Yojana with validity for 10 years i.e. upto April 2020. Subsequently, extension to the validity of EC granted by MoEF&CC vide letter dated 23/06/2020 for 3 years i.e. upto 18/04/2023. The committee further noted that in view of the Ministry's Notifications dated 18.01.2021 and 12.04.2022, extension to the validity of EC granted by MoEF&CC vide letter dated 07/05/2024 for another period of two years i.e. upto 18.04.2026.

- The EAC noted that the present project proposal comes under "B1" category; as per the provisions of the EIA Notification, 2006, as amended as Culturable Command Area (CCA 53,025Ha). However, the project is falling between two states i.e. Maharashtra-Madhya Pradesh Interstate boundary lies at a distance of 9.20Km north-east side from Stage-IA Pump House located on the Purna river hence, it requires appraisal at the Central level as Category 'A' by the Expert Appraisal Committee (EAC).

- The EAC observed that the proposed project is for Bodwad Parisar Sinchan Yojana, a lift irrigation scheme in the Tapi River Basin in Jalgaon and Buldhana districts of Maharashtra. The project involves lifting 198.54 MCM (7.01 TMC) of water during the monsoon from Hatnur Dam on the Purna River and storing it in two stages Junone Reservoir (120.78 MCM) and Jamthi Reservoir (42.91 MCM). The Committee noted that the scheme aims to utilize 197.574 MCM of water to irrigate an ICA of 42,420 ha and a CCA of 53,025 ha, benefiting 101 villages across Bodwad, Jamner, Muktainagar (Jalgaon) and Malkapur, Motala (Buldhana). The project is a joint initiative of Tapi Irrigation Development Corporation (63% ICA) and Vidarbha Irrigation Development Corporation (37% ICA), reflecting coordinated basin-level development.

- The committee noted that Bodwad Parisar Sinchan Yojana is being implemented in two Stages i.e. Stage I and Stage II with a total irrigation potential of 42,420 Ha.

Stage I of Bodwad Parisar Sinchan Yojana

The Stage-I of Bodwad Parisar Sinchan Yojana comprises of Junone Dam, lift and distribution system to irrigate a command area of 32,540 hectares. The lift system of Stage-I is further divided into two sub-stages, namely, Stage-1A and Stage-1B which together facilitate lifting of water from the Purna River up to the Junone Reservoir.

Stage II of Bodwad Parisar Sinchan Yojana

The Stage–II of the Bodwad Parisar Sinchan Yojana envisages to construct the Jamthi Dam and to lift water into the reservoir through a dedicated lift irrigation system comprising pumping machinery and rising mains. From the Jamthi Dam, water will be conveyed by gravity through a pressurised piped distribution system to irrigate a command area of 9,880 hectares.

- The EAC observed that the work pertaining to Bodwad Parisar Sinchan Yojana was started in May 2017 and is currently under progress. As it is informed by the PP during the meeting, of the total project cost of Rs. 3,76,360.49 Lakhs, a consolidated amount of Rs. 2,31,800 Lakhs have been incurred towards construction of the components of Stage-I Bodwad Parisar Sinchan Yojana as on 31st March, 2026. Therefore, the percentage of the physical construction status of the project as estimated based on the cost incurred is deduced to be 61.59%. No construction work of Stage-II has been started, only survey and conceptual planning for Jamthi Dam have been completed.

- The EAC noted that the land requirement for Stage I of the project i.e. the Junone Dam and its associated components require a total land area of 647.38 hectares, of which 527.26 hectares has already been acquired, while 120.12 hectares remains under acquisition. The Government land requirement of 5.25 hectares has been fully acquired. In the case of private land, 16.10 hectares is required, out of which 14.70 hectares has been acquired and the remaining 1.40 hectares is under process, including approvals and joint measurement for certain components. For forest land, 626.03 hectares is required, of which 507.31 hectares has been acquired, and the balance 118.72 hectares is under diversion process with the Forest Department. The application for obtaining Forest clearance for additional 118.72 Ha. of forest land have been submitted on the Parivesh Portal vide Proposal No. FP/MH/HYD/IRRIG/537001/2025 dated 09/05/2025. At present, the boundary demarcation process is in progress.

- For Stage-II of the project i.e. the Jamthi Dam, a total of 667.75 hectares of land, comprising 626.80 hectares of private land and 40.95 hectares of Government land is required. No land has been acquired so far, and the entire area remains to be acquired in accordance with the RFCTLARR Act, 2013 and Maharashtra Rules, 2013. No forest land is involved under this project component. Under this scheme, no gaothan (village habitation) is affected, either fully or partially.

- It was further noted that there are No national parks, wildlife sanctuaries, Biosphere Reserves, Tiger/Elephant Reserves, Wildlife Corridors etc. within 10 km distance from the project site. The proposed project has obtained following approvals:

  — Central Water Commission vide letter dated 29/03/2011 granted approval to the Bodwad Area Irrigiation Scheme.

  — Stage–I of the project was included under PMKSY based on CWC decision dated 12/09/2022, with formal approval by Ministry of Jal Shakti vide letter No. P-19011/14/2022-O/o-SJC (SPR-II)-MOWR/3500-13 dated 06/12/2023.

  — The Project received original administrative approval in September 1999, i.e., prior to the enactment of the Maharashtra Water Resources Regulatory Authority (MWRRA) Act, 2005.

  — Vidarbha Irrigation Development Corporation approved the project as a joint project (37% command area in Buldhana) vide letter No. 2066/VIPAVIM/Ka.Tan.-3/9/2008 dated 06/05/2008, permitting Tapi Irrigation Development Corporation to execute the works.

- The EAC noted that the MoEF&CC Notification S.O. 1247(E), dated the 18th March, 2021 inter-alia states that "*….the projects where construction and commissioning of proposed activities have not been completed within the validity period of the Environmental Clearance (EC) and a fresh application for EC has been submitted due to expiry of the said period of the EC, the concerned Expert Appraisal Committee or State Level Expert Committee, as the case may be, may exempt the requirement of public hearing subject to the condition that the project has been implemented not less than fifty percentage in its physical form or construction…..*" .

- The EAC observed that the overall construction of the project is 61.59%, therefore, the EAC opined that the fresh Public Hearing may be exempted as per provisions of the above mention notification, however, general public may be consulted by inviting their comments through SPCB.

53.2.4 The EAC based on the information submitted and as presented during the meeting, recommended the proposal for grant of Standard ToR issued by the Ministry for conducting EIA/EMP study with Public Consultation (without Public hearing) for Bodwad Parisar Sinchan Yojana (CCA of 53,025 Ha) in an area of 1315.13Ha located at Sub District Jamner, Motala, Muktainagar (Edlabad), Malkapur and Bodvad, District Jalgaon and Buldana, Maharashtra by M/s Tapi Irrigation Development Corporation, Jalgaon, under the provisions of EIA Notification, 2006, as amended along with the following additional/specific ToR:

[A] Environmental Management and Biodiversity Conservation:

i. PP shall obtain certified compliance report from Regional office, MoEF&CC. The report shall specifically verify the physical construction status (in %) of the project, including extent of works completed, ongoing activities, and compliance with

stipulated Environmental Clearance conditions.

ii. An affidavit shall be submitted by the PP stating that construction activities of the project were carried out only up to the validity period of the EC dated 19.04.2010, and that no construction or related works have been undertaken thereafter.

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

iv. A detailed wildlife conservation plan for Schedule –I species along with mitigation measures for minimizing the human–animal conflict, duly approved by the Chief Wildlife Warden, be submitted.

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

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

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

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

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

x. PP shall prepare detailed plan for Plantation of saplings under the tree plantation campaign "Ek Ped Ma Ke Naam".

[B] Socio-economic Study:

i. Public Health Delivery Plan including the provisions of drinking water supply for local population shall be in the EIA/EMP Report. Status of the existing medical facilities in the project area shall be discussed. Possibilities of strengthening of

existing medical facilities, construction of new medical infrastructure etc. will be explored after assessing the need of the labour force and local population.

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

iii. Issues raised during earlier Public hearing and compliance of the same shall be submitted in the EIA/ EMP report in the relevant chapter along with comments received from general public during public consultation to be done.

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

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

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

[C] Muck Management:

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

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

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

[D] Miscellaneous:

i. PP shall obtain clearance from the inter-State aspect from the designated authorities as per the procedure.

ii. PP shall provide details of acquisition of land for the proposed project as per OM no. 22-76/2014-IA.III dated 07.10.2014.

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

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

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

Agenda Item No. 53.3

Amba Open Loop Pumped Storage Project (1500 MW) in an area of 272.21 Ha located at Sub District Mawal and Sudhagad, District Pune and Raigad, Maharashtra by M/s NTPC Limited - Terms of References (TOR) – reg.

[Proposal No. IA/MH/RIV/575297/2026; F. No. J-12011/18/2026-IA.I(R)]

53.3.1 The proposal is for grant of Terms of Reference (ToR) to the project Amba Open Loop Pumped Storage Project (1500 MW) in an area of 272.21 Ha located at Sub District Mawal and Sudhagad, District Pune and Raigad, Maharashtra by M/s NTPC Limited.

52.3.2 The Project Proponent and the accredited Consultant M/s WAPCOS Ltd., made a detailed presentation on the salient features of the project and informed that:

i. The proposed project is the Amba Pumped Storage Project, with an installed capacity of 1500 MW, and is located in the Pune/Raigad district of Maharashtra. Amba Pumped Storage Project (6X250 MW) is proposed as an open loop pumped storage scheme.

ii. The proposed Upper Reservoir, located on Seasonal Nala, which drains into Pawana/Pauna lake on the Pawana/Pauna River, which is a tributary of the Bhima River, has a live storage of 6.13 MCM. The Lower Reservoir is located on seasonal Sayali Nala, which Merges into Uttara Nadi, which is a tributary of Amba River, with a live storage capacity of 6.995 MCM.

iii. The two reservoirs will be interconnected by a water conductor system designed to utilize an available gross head of 617.33 m. An underground powerhouse will be constructed to house six fixed-speed, reversible Francis turbine-generator units, along with associated equipment such as generator-motor assemblies, transformers, and other auxiliaries. The operational strategy for the project involves daily peaking generation for 5 hours, 57.17 minutes (average) to meet peak demand. Pumping operations will be carried out using offpeak grid power and surplus Variable Renewable Energy (VRE).

iv. The project envisages the installation of six (6) reversible pump-turbine units, each of 250 MW capacity, in an underground powerhouse, resulting in a total installed capacity of 1500 MW (6 × 250 MW). Power generation will be achieved by utilizing an average gross head of 617.33 m through a water conductor system of approximately 4655 m in length.

v. The geographical co-ordinate of the project are 18°42'11"N, 73°24'30.22"E (Left Bank) & 18°42'4.64"N,73°24'18.49"E (Right Bank) for Upper Reservoir and 18°40’43.56”N & 73°21’48.71” E (Left bank) & 18°41’6.53” N & 73°21’39.85” E (Right bank) for Lower Reservoir

vi. Amba Pumped Storage Project (6 x 250 MW), envisages construction of: Upper Dam with Spillway, Lower Dam with Spillway, Power intake, Headrace tunnel, Up Stream Surge Shaft, Pressure shaft, MAT and construction Adits, Underground Powerhouse and transformer cavern, Draft Tube and Tailrace tunnel, Down Stream Surge Shaft, Tailrace Tunnel outfall structures

vii. **Land requirement:**

Nature of Land involved	**Area in Ha**
Non-Forest Land (A)	159.65 ha
Forest Land (B)	112.56 ha
Total Land (A+B)	**272.21 ha**

viii. **Demographic details in 10 km radius of project area:**
The proposed project is located in Mawal Taluka in Pune District and Sudhagad Taluka in district Raigad. As per Census 2011, Mawal taluka in Pune district has a total population of approximately 3.0 lakh, comprising about 1.58 lakh males and 1.42 lakh females. Sudhagad taluka in Raigad district has a population of around 1.1 lakh, including approximately 56000 males and 54000 females.

ix. **Water requirement:**
One-time water requirement for both proposed upper and lower reservoirs for PSP under consideration is only 9.683 MCM, with 0.86 MCM as the annual requirement for evaporation during dry season.

x. **Project Cost:** The estimated project cost is ₹ **7294.88 Crores** at Feb 2026 price level. The preliminary cost estimate of the project has been prepared as per guidelines of CEA / CWC. The Abstract Summary of the cost estimates is given below:

Description	**Project Cost (Price Level Feb 2026)**
Cost of Civil Works including H&M	₹ 3593.00 Cr
Cost of E&M Works	₹ 2850.00 Cr

Description	Project Cost (Price Level Feb 2026)
IDC	₹ 851.88 Cr
Total Cost of the Project (in INR Crore)	**₹ 7294.88 Cr**

xi. **Project Benefit:** The scheme would afford an annual peaking period energy generation of 3097.12 GWh annually, considering the project operation for one cycle for 5 hours 57.17 minutes peaking per day calculated with 95% capacity availability. Employment shall be generated during project construction and operation phases.

xii. **Environmental Sensitive Area:** There are no National parks, wildlife sanctuaries, Biosphere Reserves, Tiger/ Elephant Reserves, and Wildlife Corridors etc. within 10 km distance from the project site. River/ water body is flowing at a distance of km in upstream direction. However, the project components are located within Western Ghat.

xiii. **MoU / any other clearance/ permission signed with State government:** NTPC Limited signed a Memorandum of Understanding (MoU) with the Government of Maharashtra in 2024 for the development of two pumped storage projects, namely Amba PSP.

xiv. **Alternative Studies:** A total of three alternative layouts with the optimised project components have been studied for the upper and lower reservoirs.

Alternative-I:

- In Alternative-1, lower dam is proposed as a Concrete Gravity Dam with a height of about 41.0 m and a crest length of 834.3 m. This dam is located across a seasonal stream known as Sayali Nala, which drains into Uttara Nadi, a tributary of the Amba River
- The upper dam is located approximately 5.2 km in the north-easterly direction from the proposed lower reservoir, near a cliff section. It is proposed as a Concrete Gravity Dam with a height of about 101.0 m and a crest length of 427 m. It is situated on a seasonal nala, which is a tributary of the main stream of the Pawana (Pauna) River that ultimately drains into the Pawana Reservoir
- Available Gross head 617.33 m
- Required Live storage is 6.13 MCM
- L/H ratio is 7.52 m

- Proposed Installed capacity 1500MW

Alternative-II

- In Alternative-2, lower dam is proposed as a Concrete Gravity Dam with a height of about 42.0 m and a crest length of 855 m. This dam is located across a seasonal stream known as Sayali Nala, which drains into Uttara Nadi, a tributary of the Amba River
- The upper dam is located approximately 4.2 km in the easterly direction from the proposed lower reservoir, near a cliff section. The upper dam is proposed as a Concrete Gravity Dam with a height of about 53.0 m and a crest length of 500.00 m. It is situated on the main stream of the Pawana (Pauna) River, which ultimately drains into the Pawana Reservoir
- Available Gross head 554.50 m
- Required Live storage is 7.50 MCM
- L/H ratio is 4.63 m
- Proposed Installed capacity 1500MW

Alternative-III

- In Alternative-3, lower dam is proposed as a Concrete Gravity Dam with a height of about 40.50 m and a crest length of 821 m. This dam is located across a seasonal stream known as Sayali Nala, which drains into Uttara Nadi, a tributary of the Amba River
- The upper dam is located approximately 4.0 km in the easterly direction from the proposed lower reservoir. The upper dam is proposed as a peripheral rockfill embankment dam with a height of about 20.0 m and a crest length of approximately 2,770.00 m. The reservoir is proposed to be developed on a table top hill near Atvan.
- Available Gross head 668.0 m
- Required Live storage is 5.55 MCM
- L/H ratio is 5.49 m
- Proposed Installed capacity 1500MW

Comparative Table : Layout Alternatives

Description	**Alt-I**	**Alt-II**	**Alt-III**
Lower Reservoir			
Reservoir Type	New	New	New
Gross storage (MCM)	7.86	22.77	7.22

Proposed Live Storage (MCM)	6.995	6.70	6.35
Length of dam (m)	834.3	855	821
Height of dam (m)	41	42	40.50
Upper Reservoir			
Reservoir Type	New	New	New
Gross storage (MCM)	7.66	8.37	5.55
Proposed Live Storage (MCM)	6.13	7.5	5.55
Length of dam (m)	427	500	2770
Height of dam (m)	101	53	20
Gross Head (m)	617.33	554.50	668.00
Tentative WCS Length (m)	4640	2570	3670
L/H Ratio	7.52	4.63	5.49
Proposed Installed Capacity (MW)	1500	1500	1500
Total Hard Cost (in crore)	6443.00	6453.06	6750.11
Tentative Tariff @3 Rs pumping cost	8.87	9.03	8.99
Forest (ha.)	112.56	151.93	112.32
Non Forest (ha.)	159.65	247.44	251.17
Total (ha.)	272.21	399.37	363.49
Rank	I	III	II

- Based on the analysis, all proposed alternatives demonstrate comparable outcomes in terms of tariff.
- Alternatives–I and II offer certain advantages, particularly in terms of higher available hydraulic head. However, Alternative–III involves extensive hill cutting and a substantial quantity of muck generation, requiring disposal within forest areas, which may lead to significant environmental challenges.
- Alternative–II entails the highest requirement of forest land diversion (approximately 152 ha), which may also pose considerable regulatory and environmental constraints.
- In comparison, Alternative–I requires one of the least quantum of forest land. It also offers a favourable balance between available head, land requirement, and overall constructability of project components

xv. **Details of Solid waste/ Hazardous waste generation/ Muck and its management: Solid** Waste – 273 kg/day (Construction Phase); Management Plans to be prepared as part of EMP of EIA study after approval of ToR

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

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

- **Project details**

Name of the Proposal	Amba Pumped Storage Project (6X250 MW)
Location (Including coordinates)	Village: Gevhande Apati, Taluka: Mawal, District: Pune, and Village: Bheliv, Taluka: Sudhagad, District: Raigad, Maharashtra. **UPPER RESERVOIR** 18°42'11"N, 73°24'30.22"E (Left Bank) & 18°42'4.64"N, 73°24'18.49"E (Right Bank) **LOWER RESERVOIR** 18°40’43.56”N & 73°21’48.71” E (Left bank) & 18°41’6.53” N & 73°21’39.85” E (Right bank)
Inter- state issue involved	Nil
Seismic zone	IV

- **Category details**

Category of the project	Category A
Provisions	--
Capacity / Cultural command area (CCA)	1500 MW (6 x 250 MW)
Attracts the General Conditions (Yes/No)	No
Additional information (if any)	--

- **Electricity generation capacity**

Powerhouse Installed Capacity	1500 MW (6 x 250 MW)
Generation of Electricity Annually	3097.12 GWh
No. of Units	6 x 250 MW
Additional information (if any)	--

- **ToR/ EC Details**

Cost of project	Rs. 7294.88 Crores (Incl. IDC)
Total area of Project	272.21 Hectares
Height of Dam from River Bed (EL)	Upper dam - 101m Lower dam – 41m
Length of Tunnel/Channel	8425 m
Details of Submergence area	Upper reservoir: 35.99 Hectares (Forest Land: 35.99 Hectares, Non Forest Land :) Lower reservoir: 98.22 Hectares (Forest land: 28.42 ha. ; Non forest land: 69.80 ha.)
Types of Waste and quantity of generation during construction/ Operation	Solid Waste – 273 kg/day (Construction Phase)
E-Flows for the Project	As Applicable
Is Projects earlier studies in Cumulative Impact assessment & Carrying Capacity studies (CIA&CC) for River in which project located. If yes, then a) E-flow with TOR/ Recommendation by EAC as per CIA&CC study of River Basin. b) If not the E-Flows maintain criteria for sustaining river ecosystem.	No
No. of trees/ saplings proposed in view of 'Ek Ped Maa Ke Naam' campaign	Shall be proposed during EIA study

- **Muck Management Details**

No. of proposed disposal area/(type of land- Forest/Pvt. land)	2 no of proposed disposal area / Non Forest Land (34.40 ha.)
Muck Management Plan	To be prepared as part of EIA Studies
Monitoring mechanism for Muck Disposal	To be prepared as part of EIA Studies

- **Land Area Breakup**

Private land /Non Forest Land	159.65 ha
Government land	--
Forest Land	112.56 ha
Total Land	272.21 ha
Submergence area/Reservoir area	Upper reservoir: 35.99 Hectares (Total Forest Land) Lower reservoir: 98.22 Hectares (Forest land: 28.42 ha. ; Non forest land: 69.80
Additional information (if any)	-

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

Forest Land/ Protected Area/ Environmental Sensitivity Zone	Yes/No	**Details of Certificate/ letter/Remarks**
Reserve Forest/Protected Forest Land	Yes	Sudhagad & Wadgaon Reserved Forest
National Park	No	
Wildlife Sanctuary	No	

- **Court case detail**: Nil

- **Previous EC compliance and necessary approvals**

Particulars	**Letter no. and date**
Certified EC compliance report (if applicable)	NA
Status of Stage-I FC	Yet to be submitted
Additional detail (If any)	-
Is FRA (2006) done for FC-I	No

- **Miscellaneous**

Particulars	**Details**
Details of consultant	WAPCOS Limited
Project Benefits	• The primary objective of the proposed Amba PSP (6X250 MW) is to enhance the peak power generation • Increased power availability will support agriculture, industries, and rural electrification, thereby improving the quality of life. • Construction of roads, bridges, and buildings during the project will improve regional connectivity and benefit local communities. • A healthcare unit will be established near the dam site. Improved road access will also enhance connectivity to medical facilities. • Construction phase will generate direct and indirect employment, stimulate local businesses, and enhance trade opportunities. • A Local Area Development Plan (0.5% of project cost) will further support education, healthcare, and infrastructure development in project-affected and adjoining villages. • Employment during project construction and operation phases
Status of other statutory clearances	Yet to be submitted

R&R details	To be prepared as part of EIA Studies
Additional detail (If any)	-

53.3.3 The EAC during deliberations noted the following:

- The Expert Appraisal Committee (EAC) deliberated on the information submitted (Form 1, PFR, kml file, etc.) and as presented in the meeting and observed that the proposal is for grant of TOR for conducting EIA/EMP and Public hearing for Amba Open Loop Pumped Storage Project (1500 MW) in an area of 272.21 Ha located at Sub District Mawal and Sudhagad, District Pune and Raigad, Maharashtra by M/s NTPC Limited.

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

- The EAC observed that the Upper Reservoir, located on Seasonal Nala, which drains into Pawana/Pauna lake on the Pawana/Pauna River, which is a tributary of the Bhima River and the Lower Reservoir is located on seasonal Sayali Nala, which Merges into Uttara Nadi, which is a tributary of Amba River, since both of the reservoirs are located on Seasonal Nala therefore, the project is termed as Open Loop project.

- The EAC noted that the total land requirement for the proposed project is estimated to be approximately 272.21 ha, of which about 112.56 ha falls within forest land, while the remaining 159.65 ha is non forest land (private/revenue land). Diversion of forest land for non-forest purpose will be involved for construction of project components. However, it was observed that the application for Stage-I Forest Clearance (FC) has not yet been submitted, which necessitates further action from the Project Proponent. The One-time water requirement for both proposed upper and lower reservoirs for PSP under consideration is only 9.683 MCM, with 0.86 MCM as the annual requirement for evaporation during dry season and 0.292 MCM for one-time filling/surcharging water requirement for WCS. It is proposed that the water of the river Sayali will be used to fill up the Upper & Lower reservoirs.

- The EAC during the meeting observed that there is no Environmental sensitive area within 10km boundary of the proposed project, however, the EAC noted that all the project components are located within the proposed Western Ghats ESA, Maharashtra as per MOEF&CC draft notification S.O.30609(E) dated 31.07.2024. Additionally, the EAC noted that several projects are already proposed in the vicinity of the project area; therefore, the Committee advised PP to undertake a combined study of all projects to assess the overall environmental impacts.

- The EAC observed that Memorandum of Understanding was signed between M/s NTPC limited and Department of Water Resources, Govt. of Maharashtra on 03.09.2024, for establishment of Amba Pumped Storage project with a capacity of 800 MW. However, the present proposal submitted by the PP envisages an enhanced capacity of 1500 MW. In view of the substantial increase in the proposed capacity, the Committee opined that an amendment/revision of the existing MoU shall be required to align it with the revised project configuration.

53.3.4 The EAC based on the information submitted and as presented during the meeting, recommended the proposal for grant of Specific ToR issued by the Ministry for Open Loop Pumped Storage Projects vide OM dated 14.08.2023 for conducting EIA study for proposed construction of the project for Amba Open Loop Pumped Storage Project (1500 MW) in an area of 272.21 Ha located at Sub District Mawal and Sudhagad, District Pune and Raigad, Maharashtra by M/s NTPC Limited, under the provisions of EIA Notification, 2006, as amended along with the following additional/specific ToR:

[A] Environmental Management and Biodiversity Conservation:

i. Impact of construction activities on natural streams/springs/aquifers shall be studied and accordingly conservation action plan shall be prepared in consultation with expert government research institute after detailed mapping of the study area.

ii. PP shall obtain amendment/revision of the existing MoU to reflect the revised project capacity of 1500 MW,

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

iv. The PP will submit 10 years water availability data certified by the CWC/State Water Resource Department for quantity of water that is received annually by the small stream on which lower reservoir is proposed to be constructed.

v. The PP will submit a detailed plan and monitoring mechanism for releasing the self - catchment water of small stream draining in to river along with action plan for conservation and protection of other streams/rivulets draining in to upper and lower reservoirs.

vi. Explore the possibilities for reducing the Forest land requirement. The application for obtaining Stage I FC for 112.56 ha of forest land involved in the project shall be submitted within stipulated time.

vii. Muck disposal site and other components such as Township, site office, Stacking area

and batching plant shall be located outside the forest area.

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

ix. Transportation Plan for transporting construction materials shall be submitted. Separate chapter for risk assessment of such transportation through/within proposed the Wildlife Sanctuary shall be included in the EIA report, if any.

x. 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.

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

xii. 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.

xiii. The longitudinal connectivity/Free flowing sketch be provided in the EIA/EMP report.

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

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

xvi. Action plan for survival or diversion of the rivulets/stream, if any, leading to join river shall be submitted.

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

xviii. A study shall be carried out on impact of project activity on the aquatic and terrestrial ecosystem, within project area classifying the impact zones (highly impact/low impact

zone) based on seasonal variations and covering the aspects related to impacts on aquatic ecosystem/ primary productivity due to quantity of water to be lifted for power generation and thermal stratification. Accordingly, Environment Management plan shall be prepared.

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

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

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

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

xxiii. Combined Impact of projects proposed on carrying capacity and sustainability of the natural stream/Reservoir/ River /nala of catchment area due to tapping of water for filling reservoir shall be studied.

xxiv. The EAC site visit shall be conducted before considering the proposal for grant of Environmental Clearance in view of project location in Western Ghats.

[B] Socio-economic Study:

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

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

iii. The EIA/EMP shall include a detailed socio-economic assessment of the tribal population in the project-affected area based on primary data and community consultations. A Tribal Development Plan, prepared in consultation with the District

Administration and Tribal Welfare Department, shall be submitted along with the EIA report.

iv. 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 as amended, for the project land to be acquired.

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

[C] Muck Management:

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

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

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

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

[D] Disaster Management:

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

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

[E] Miscellaneous:

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

ii. PP shall follow all the terms and conditions mentioned in draft notification issued by MOEF&CC vide S.O.3060(E) dated 31.07.2024 of Western Ghats ESA for preparation of EIA/EMP report.

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

iv. 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.

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

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

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

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

ix. PP shall provide details of acquisition of land for the proposed project as per OM no. 22-76/2014-IA.III dated 07.10.2014.

Agenda Item No. 53.4

Greenko BR-01 Closed Loop Pumped Storage Project (1200 MW) in an area of 310.88 Ha located at Sub District Gobindpur, Akbarpur and Rajauli, District Nawada, Bihar M/s Greenko BR01 IREP Private Limited - Terms of References (TOR) – reg.

[Proposal No. IA/BR/RIV/575575/2026; F. No. J-12011/22/2026-IA.I(R)]

53.4.1 The proposal is for grant of Terms of Reference (ToR) to the project Greenko BR-01 Closed Loop Pumped Storage Project (1200 MW) in an area of 310.88 Ha located at Sub District Gobindpur, Akbarpur and Rajauli, District Nawada, Bihar M/s Greenko BR01 IREP Private Limited.

52.4.2 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. The proposed Greenko BR-01 OCPSP is a self-identified project and Greenko Group has been in the process of evaluating suitable locations for such Hydro Storage for over 1 year and has identified near Parsauni & Tupariya village, Rajauli Subdivision, Nawada District, Bihar for the proposed Greenko BR-01 OCPSP.

ii. The Off-Stream Closed Loop Pumped Storage Component of Greenko BR-01 OCPSP envisages construction of upper reservoir near Ekamba Village, Jogya maran Panchyat, Rajauli Sub-Division, Nawada district, Bihar State and lower reservoir near Parsauni & Tupariya Village, Sughari Panchayat, Gobindpur Circle, Rajauli Block/Subdivision, Nawada district, Bihar State. The one-time requirement of 0.321 TMC of water will be lifted from existing Sakri River to fill up the proposed Greenko BR-01 OCPSP lower reservoir which is located at about 9 km from the proposed lower reservoir.

iii. The Greenko BR-01 Off-Stream Closed Loop Pumped Storage Project is proposed with a Storage Capacity of 7316 MWH with Rating of 1200 MW. This Project is comprising of 4 units of 300 MW each. The installed capacity of a pumped storage scheme is influenced by the requirements of daily peaking power requirements, flexibility in efficient operation of units, storage available in the reservoirs and the area capacity characteristics.

iv. The Project will generate 1200 MW by utilizing a design discharge of 361.21 Cumec and rated head of 381.50 m for all four units. The Greenko BR-01 OCPSP will utilize 3222 Mu to pump 0.28 TMC of water to the upper reservoir in 7.04 hours.

v. The geographical co-ordinate of the project is Upper reservoir is at Longitude 85°36'35" East and Latitude is 24°41'30" North and that of Lower reservoir is at longitude 85°36'50" East and latitude is 24°42'35" North.

vi. The Greenko BR-01 Off-Stream Closed Loop Pumped Storage Project (1200 MW) envisages construction of:

- Geomembrane Faced Rock fill Dam Embankment of weighted average height of around 17m with maximum of 48m height in upper reservoir and weighted average height of around 17m with maximum of 22m in lower reservoir for creation of Greenko BR-01 OCPSP upper & lower reservoir with 0.28 & 0.285 TMC live storage capacity respectively

- 44.0 m high Power Intake Structure.
- 2 nos. of 1112.40 m long and 6.5m dia. circular steel lined Penstocks/ Pressure Shafts (i.e., consisting of 30 m long Intake Tunnel, 558.25 m long surface penstock, 200.14 m long vertical pressure shaft and 324 m long Horizontal pressure shaft up to bifurcation point) will get bifurcated into 2 nos. near power house each of 4.5m dia. of about 100m long penstock/pressure shaft to feed 2 units of 300 MW.
- A surface Powerhouse having an installation of Four reversible Francis turbine each of 300 MW capacity (all units are Fixed speed turbines) operating under a rated head of 381.50 m in generating mode & 400.50m in pumping mode.

vii. **Land requirement:**

The total land requirement for proposed project is about 310.88 Ha; out of which 231.41 Ha is forest land and remaining 79.47 Ha is non-forest land.

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

- The villages located in and around the project area are small, dispersed, and predominantly dependent on agriculture. Overall population density is lower than the state average.
- Most residents rely on farming, livestock rearing, fishing, and daily wage labour for their livelihood.
- Although basic amenities such as schools, healthcare centres, and road connectivity are present, they are still not fully developed.
- The proportion of Scheduled Tribe population in the project area is very low.
- Major crops cultivated in the region include rice, wheat, pigeon pea, lentils, and other seasonal produce.
- According to the Census of India (2011), most of the villages in the project area are uninhabited, including **Ekamba, Parsauni, Tupariya, Jhirkhi,** and others.

Parameters	**Budhuwa**	**Ektara**	**Jaipur**	**Dhanpuri**	**Jatsari**
Households	167	431	37	225	121
Total Population	1486	2868	221	1541	735
Male Population	741	1471	116	763	397
Female Population	745	1397	105	778	338
Scheduled Caste (SC) Pop.	163	1384	218	455	346
Scheduled Tribe (ST) Pop.	0	0	0	4	0

(Source: Census 2011)

- Ektara is the largest settlement with 431 households and a population of 2,868, followed by Dhanpuri with 1,541 people in 225 households.
- Budhuwa has a moderate population of 1,486 while Jatsari and Jaipur are the smallest villages with 735 and 221 residents respectively.
- Across all villages, the male and female populations are fairly balanced, with no major gender disparity.
- The presence of Scheduled Caste (SC) communities is notable in all villages, particularly in Jaipur (218) and Jatsari (346), indicating a substantial SC population share as per total population.
- Scheduled Tribe (ST) populations are almost negligible.

ix. **Water requirement:**
The water requirement for the project for initial filling (one-time) is about 9.09 Mm^3 (0.321 TMC) and the net annual evaporation losses will be around 1.416 Mm^3 (0.05 TMC) to be recouped annually from Sakri river.

x. **Project Cost:**
The estimated project cost is Rs 7807.89 Crores. Total capital cost earmarked towards environmental pollution control measures will be worked out during EIA study as well as the Recurring cost (operation and maintenance).

xi. **Project Benefit:**
The project is expected to generate significant employment potential during both the construction and post-construction phases, contributing to local livelihood opportunities. Additionally, it will support the overall development of the area through the implementation of Corporate Social Responsibility (CSR) initiatives and comprehensive watershed development plans.

xii. **Environmental Sensitive area:**
The project is located around 5.5 km from Rajauli (Nawada) Wildlife Sanctuary. Since the ESZ boundary notification is in draft stage, wildlife clearance is applicable. Water will be pumped from Sakri River.

xiii. **MoU / any other clearance/ permission signed with State government:**
MoU is entered with Bihar state government on 16.12.2025 for a capacity of 1200 MW

xiv. **Resettlement and rehabilitation:** Based on the findings of the socio-economic studies and survey during EIA studies, an appropriate R&R compensation package as per the provisions of Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement, 2013 (RFCTLARR, 2013) and respective State R&R Policy in vogue would be required to be formulated.

xv. **Alternative Studies:**

Three alternative layouts were considered for the project. Alternative-1 is preferred as it minimizes reservoir embankment and tail race tunnel lengths and allows partial surface penstock, resulting in lower construction time, cost, and complexity. Alternatives-2 and-3 involve longer underground structures, additional surge tank or tail race channel, higher land and forest requirements, and greater environmental and economic impacts, making them techno-economically unviable.

xvi. **Details of Solid waste/ Hazardous waste generation/ Muck and its management:** The solid waste will be transported for disposal at the designated landfill sites. The bio- degradable portion of the solid waste would be disposed of by composting. Project will identify authorized vendors for recycling or disposal of Hazardous waste like used batteries, used oil and used oil filters. The total quantity of muck likely to be generated from excavation including construction of road is about 8.29 Mcum. The entire excavated material, after reutilization, is proposed to be disposed of at two designated muck disposal sites covering areas of 15 hectares and 10 hectares, respectively.

xvii. **Status of Litigation Pending against the proposal, if any:** NA

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

- **Project details:**

Name of the Proposal	Greenko BR-01 Off-stream Closed Loop Pumped Storage Project
Location (Including coordinates)	The project is located in Ekamba, Parsauni & Tupariya villages, Gobindpur, Akbarpur, & Rajauli Subdivisions, Nawada District, Bihar. Upper Reservoir - Latitude: 24°41'30"N Longitude: 85°36'35"E
Inter- state issue involved	No
Seismic zone	Zone III and IV

- **Category details:**

Category of the project	1 (c)
Provisions	
Capacity / Cultural command area (CCA)	1200 MW
Attracts the General Conditions (Yes/No)	Yes
Additional information (if any)	NA

- **Electricity generation capacity:**

Powerhouse Installed Capacity	1200 MW
Generation of Electricity Annually	2537 MU
No. of Units	4 X 300 MW
Additional information (if any)	NA

- **ToR/EC Details:**

Cost of project	7807.89 crores
Total area of Project	310.88 Ha
Height of Dam from River Bed (EL)	Upper Reservoir: 48 m & Lower Reservoir: 22 m
Length of Tunnel/Channel	3559m (WCS length)
Details of Submergence area	185.69 Ha
Types of Waste and quantity of generation during construction/ Operation	Major waste generation is muck from excavation. Total quantity of excavated material is worked out as 8.29 Mcum
E-Flows for the Project	NA
Is Projects earlier studies in Cumulative Impact assessment & Carrying Capacity studies (CIA&CC) for River in which project located. If yes, then a) E-flow with TOR /Recommendation by EAC as per CIA&CC study of River Basin. b) If not the E-Flows maintain criteria for sustaining river ecosystem.	NA
No. of trees/saplings proposed in view of 'Ek Ped Maa Ke Naam' campaign	500

- **Muck Management Details:**

No. of proposed disposal area/(type of land- Forest/Pvt. land)	Non-Forest Land – 25 Ha, comprising of 2 Muck disposal sites of 15 Ha and 10 Ha each
Muck Management Plan	The total quantity of muck generated is 8.29 Mcum, in which 4.93 Mcum of excavated muck is expected to be

	reutilized. The Rehabilitation plan of muck dumping site includes engineering and biological measures and will be incorporated in EIA report.
Monitoring mechanism for Muck Disposal	Properly covered Dumper trucks will be used for transportation.

- **Land Area Breakup:**

Private land	79.47 Ha
Government land	-
Forest Land	231.41 Ha
Total Land	310.88 Ha
Submergence area/Reservoir area	185.69 Ha
Additional information (if any)	-

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

Forest Land/ Protected Area/ Environmental Sensitivity Zone	**Yes/No**	**Details of Certificate/ letter/ Remarks**
Reserve Forest/Protected Forest Land	Yes	231.41 Ha forest land to be diverted. Application for the diversion of forest land is yet to be submitted as it is in the preparation stage.
National Park	No	
Wildlife Sanctuary	Yes	• The project is located around 5.5 km from Rajauli (Nawada) Wildlife Sanctuary. • Since the ESZ boundary notification is in draft stage, wildlife clearance is applicable.

- **Court case details: Nil**

- **Miscellaneous**

Particulars	**Details**
Details of consultant	M/s. R S Envirolink Technologies Pvt. Ltd. (RSET) (*NABET* Accredited *Consultant Organization*) Certificate No: NABET/EIA/25-28/RA0415 Validity : August 15, 2028

	Contact Person: Mr. Ravinder Bhatia Name of Sector: River Valley and Hydroelectric Projects Category : A MoEF Schedule: I(C) Address : 403, Bestech Chambers, Block-B, Sushant Lok Phase I, Sector 43, Gurugram, Haryana - 122009 E-mail : ravi@rstechnologies.co.in Land Line : (0124) 4295383 Cellular : (+91) 9810136853
Project Benefits	The project is expected to generate significant employment potential during both the construction and post-construction phases, contributing to local livelihood opportunities. Additionally, it will support the overall development of the area through the implementation of Corporate Social Responsibility (CSR) initiatives and comprehensive watershed development plans
Status of other statutory clearances	Forest Clearance - Online application seeking forest diversion for around 231.41 Ha will be submitted after receipt of ToR Approval. Alongside, other statutory clearances (as applicable) from State as well as Central government will be obtained post completion of Detailed Project Report.
R&R details	Applicable. Based on the findings of the socio-economic studies and survey, an appropriate R&R compensation package as per the provisions of Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement, 2013 (RFCTLARR, 2013) and respective State R&R Policy in vogue would be required to be formulated.
Additional detail (If any)	NA

53.4.3 The EAC during deliberations noted the following:

- The Expert Appraisal Committee (EAC) deliberated on the information submitted (Form 1, PFR, kml file, etc.) and as presented in the meeting and observed that the proposal is for grant of TOR for conducting EIA/EMP and Public hearing for Greenko BR-01 Closed Loop Pumped Storage Project (1200 MW) in an area of 310.88 Ha located at Sub District Gobindpur, Akbarpur and Rajauli, District Nawada, Bihar M/s Greenko BR01 IREP Private Limited.

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

- The EAC noted that as per the details submitted by the PP, the upper reservoir and lower reservoir are located away from any riverine system, therefore the current proposal is termed as a Closed Loop Pumped Storage Project.

- The EAC observed that the total land required for the project components and related works has been estimated to be about 310.88 Ha; out of which 231.41 Ha is forest land and remaining 79.47 Ha is non-forest land. Diversion of forest land for non-forest purpose will be involved for construction of project components. However, it was observed that the application for Stage-I Forest Clearance (FC) has not yet been submitted, which necessitates further action from the Project Proponent. The water requirement for the project for initial filling (one-time) is about 9.09 Mm3 (0.321 TMC) and the net annual evaporation losses will be around 1.416 Mm3 (0.05 TMC) to be recouped annually from Sakri river.

- The EAC noted that the proposed project is located approximately 5.5 km from Rajauli (Nawada) Wildlife Sanctuary. As the Eco-Sensitive Zone (ESZ) notification is presently in draft stage, Wildlife Clearance is applicable; accordingly, the EAC was of the view that PP shall obtain prior clearance from the National Board for Wildlife (NBWL).

- The Committee observed that another project is located in close proximity to the present proposal; therefore, in order to minimize land requirement, including forest land, the EAC suggested that the Project Proponent explore the feasibility of integrating/shared access roads for the upper reservoirs of both projects.

- The EAC observed that Memorandum of Understanding was signed between Bihar State Power Generation Company Limited (BSPGCL) and M/s Greenko Energies Private Limited on 16.12.2025. However, the present proposal has been submitted in the name of M/s Greenko BR01 IREP Private Limited, whereas the MoU is in the name of M/s Greenko Energies Private Limited. Accordingly, the Committee opined that amendment/revision of the existing MoU is required to reflect the correct name of the Project Proponent.

53.4.4 The EAC based on the information submitted and as presented during the meeting, recommended the proposal for grant of Specific ToR issued by the Ministry for Close Loop Pumped Storage Projects vide OM dated 14.08.2023 for conducting EIA study for proposed construction of the project for Greenko BR-01 Closed Loop Pumped Storage Project (1200 MW) in an area of 310.88 Ha located at Sub District Gobindpur, Akbarpur and Rajauli, District Nawada, Bihar M/s Greenko BR01 IREP Private Limited., under the provisions of EIA Notification, 2006, as amended along with the following additional/specific ToR:

[A] Environmental Management and Biodiversity Conservation:

i. PP shall obtain amendment/revision of the existing MoU to reflect the correct name of the Project Proponent.

ii. PP shall obtain prior clearance from the National Board for Wildlife (NBWL).

iii. PP shall explore the possibilities to integrate access roads for the upper reservoirs with nearby projects in order to minimize overall land requirement, including forest land.

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

v. The PP will submit 10 years water availability data certified by the CWC/State Water Resource Department for quantity of water that is received annually by the small stream on which lower reservoir is proposed to be constructed.

vi. The PP will submit a detailed plan and monitoring mechanism for releasing the self - catchment water of small stream draining in to river along with action plan for conservation and protection of other streams/rivulets draining in to upper and lower reservoirs.

vii. Explore the possibilities for reducing the Forest land requirement. The application for obtaining Stage I FC for 231.41 Ha of forest land involved in the project shall be submitted within stipulated time.

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

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

x. Transportation Plan for transporting construction materials shall be submitted. Separate chapter for risk assessment of such transportation through/within proposed the Wildlife Sanctuary shall be included in the EIA report, if any.

xi. 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.

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

xiii. 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.

xiv. The longitudinal connectivity/Free flowing sketch be provided in the EIA/EMP report.

xv. 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.

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

xvii. Action plan for survival or diversion of the rivulets/stream, if any, leading to join river shall be submitted.

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

xix. 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.

xx. Reservoir/ River banks protection plan all along the submergence need to be prepared

and incorporated in EIA/ EMP.

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

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

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

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

[B] Socio-economic Study:

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

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

iii. The EIA/EMP shall include a detailed socio-economic assessment of the tribal population in the project-affected area based on primary data and community consultations. A Tribal Development Plan, prepared in consultation with the District Administration and Tribal Welfare Department, shall be submitted along with the EIA report.

iv. 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.

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

be included in the cost of EMP.

[C] Muck Management:

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

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

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

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

[D] Disaster Management:

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

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

[E] Miscellaneous:

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

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

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

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

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

vi. 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.

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

viii. The EAC will conduct site visit before considering the proposal for grant of environmental clearance.

ix. PP shall provide details of acquisition of land for the proposed project as per OM no. 22-76/2014-IA.III dated 07.10.2014.

Agenda Item No. 53.5

Aruna Open Loop Pumped Storage Project (1500 MW) in an area of 334.45 Ha located Sub District Bavda and Vaibhavvadi, District Kolhapur and Sindhudurg, Maharashtra by M/s THDC India Limited – Terms of References (TOR) – reg.

[Proposal No. IA/MH/RIV/574543/2026; F. No. J-12011/19/2026-IA.I (R)]

53.5.1 The proposal is for grant of Terms of Reference (ToR) to the project Aruna Open Loop Pumped Storage Project (1500 MW) in an area of 334.45 Ha located Sub District Bavda and Vaibhavvadi, District Kolhapur and Sindhudurg, Maharashtra by M/s THDC India Limited.

53.5.2 The Project Proponent and the accredited Consultant M/s. EQMS India Pvt. Ltd made a detailed presentation on the salient features of the project and informed that:

i. The proposed Aruna Pumped Storage Project (1500MW) is being developed by M/s THDC India Ltd. (THDCIL). Both the upper and lower dam for the PSP are proposed to be newly constructed.

ii. The proposed upper dam, (Type: RCC; Length at top: 475.50m; Max. Height: 45m) shall be located across a small stream draining into Kumbhi river near Vesaraf village,

Gaganbawada taluka, Kolhapur district. The lower dam (Type: RCC; Length at top: 480.70m; Max. Height: 69m) shall be located on a small stream draining into Aruna River near Mounde village, Vaibhavwadi Taluka, Sindhudurg district. The water conductor system and powerhouse shall be totally underground.

iii. The initial filling requirement (13.58MCM) of lower reservoir shall be met from rainfall yield of catchment (4.67sq km) in two monsoon seasons besides annual recoupment of evaporation losses and transit losses of both reservoirs 1.165 MCM (0.711+0.454). About 10.78 MCM of water will be recirculated for power generation and pumping. The annual average energy generation in turbine mode for daily 6.00 hours shall be 3120.75 MU whereas annual energy consumption in pump mode for daily 6.86 hours is 3923.94 MU.

iv. The geographical co-ordinate of the project are:

Upper Reservoir Coordinates: 16°35'39.87"N, 73°51'19.51"E
Lower Reservoir Coordinates: 16°36'32.43"N, 73°50'37.75"E

v. **Land requirement:** Total land requirement is 334.45 ha (Forest: 73.60 ha; Non-Forest: 260.85 ha).

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

As per the Census of India 2011, the total population of 81 villages of study area comprising of total 13086 households is 55769 composed of 27342 males and 28427 females with sex ratio of 1040.The cast wise composition of the total population of the project affected villages is made up of scheduled cast population of 6141(11.01%) and Scheduled Tribe population of 170(0.30%). The literate population is 35864(71.86%) of which the male and female population is 20065(82.55%) and 15799(58.39%) respectively. The gender gap for literacy rate is 20.83 %. The total working population is 26485(47.49%), which comprises 18551(33.26%) and marginal workers 7934(14.23%).

vii. **Water requirement:** The quantity of water required during construction is estimated as 1230 kld (Construction-1100 kld; Domestic-130kld) and during operation shall be 50kld, which shall be drawn from catchment of local nallas.

viii. **Project Cost:** The estimated project cost is Rs 9126.10 crores including IDC. Total capital cost and recurring annual cost (operation & maintenance) towards EMP shall be earmarked after evaluating cost of EMPs.

ix. **Project Benefit:** The benefits inter alia shall include (i) Average annual generation of 3120.75 MU of energy; (ii) Increased vegetal cover due to implementation of CAT Plan and Green Belt Development Plans (iii) Employment Potential during

construction (1500 labour); (iv) Overall development of area by implementing CSR initiatives and Watershed Development Plans.

x. **Environmental Sensitive area**: Radha Nagri WLS and its ESZ are located about 12.48 km and 7.03 km from the nearest project boundary. The upper reservoir is covered under Gaganbawada Conservation Reserve. Apart from this, the project villages viz. Vesaraf and Mounde are also covered under Western Ghat ESA as per Draft Notification S.O. 3060(E), dated 31.7.2024. No archaeological monument of national importance lies either in the project area or in its submergence area. There is also no national heritage structure in the area. There is neither any Inter-state nor national boundary within 10 km from project boundaries.

xi. **MOU/ any other clearance/ permission signed with State government:** MoU was signed between M/s THDCIL and Department of Water Resources, Govt. of Maharashtra on 03rd day of September 2024, for establishment of Aruna PSP.

xii. **Alternative Studies:**

The location of upper reservoir and lower reservoir are fixed as per the topography and storage requirement. The upper reservoir at Vesaraf village shall have gross and live storage capacity of 12.75MCM and 12.08MCM at FRL(El.632M) with MDDL El.604m. The dam length at top and height from deepest bed level shall be 475.5m and 45m respectively Primarily three alternatives water conductor system were studied.

DPR Alternate-1(1000MW): The lower reservoir of DPR Alt – 1 is located at Mounde village and shall have gross and live storage capacity of 9.41MCM and 7.93MCM at FRL(El.305m) with MDDL El.264m.The dam length at top and height from deepest bed level shall be 777.75 m and 84m respectively. Cumulative Length of WCS shall be 2.05km with 0.95lm long TRT and L/H Ratio of 6.42. Powerhouse with installed capacity 1000 MW (4x250MW) shall be underground. Annual energy generation at 95% plant availability shall be 2080.50 MU. Total land requirement shall be 328.95ha comprised of 73.10ha forest land. The total cost of project is Rs 7696.09Cr with a levelized tariff at Rs 4.91 /unit pumping cost shall be Rs 8.10/ unit.

DPR Alternate-2(1500MW): The lower reservoir of DPR Alt – 2 is located upstream of Mounde village and shall have gross and live storage capacity of 12.76MCM and 12.00 MCM at FRL(El.291m) with MDDL El.248m.The dam length at top and height from deepest bed level shall be 480.70 m and 69m respectively. Cumulative Length of WCS shall be 1.16km with 0.342km long TRT and L/H Ratio of 3.45. Powerhouse with installed capacity 1500 MW (6x250MW) shall be underground. Annual energy generation at 95% plant availability shall be 3120.75 MU. Total land requirement shall be 334.45ha comprised of 73.60ha forest land. The total cost of

project is Rs 9126.10 with a levelized tariff at Rs 3.88 /unit pumping cost shall be Rs 7.06/ unit

DPR Alternate-3(1000MW): The lower reservoir of DPR Alt – 3 is located upstream of the lower reservoir of DPR Alt – 2 and shall have gross and live storage capacity of 9.40 MCM and 8.69 MCM at FRL(El.335m) with MDDL El.280m.The dam length at top and height from deepest bed level shall be 519.60 m and 90m respectively. Cumulative Length of WCS shall be 1.43km with 0.60km long TRT and L/H Ratio of 4.33. Powerhouse with installed capacity 1000 MW (4x250MW) shall be underground. Annual energy generation at 95% plant availability shall be 2080.5 0MU.Total land requirement shall be 317.49ha comprised of 72.60ha forest land. The total cost of project is Rs 7124.09Cr with a levelized tariff at Rs 4.54 /unit pumping cost shall be Rs 7.75/ unit

Based on the above comparison, DPR Alternative - 2 with minimum interference with Mounde village, 1500 MW capacity, 69 m high dam at lower reservoir and 342 m long TRT provides the most efficient solution. And hence considered for further studies.

xiii. **Baseline Environmental Scenario:** Baseline environmental data collection for pre-monsoon is ongoing and for post-monsoon 2026 is to be collected.

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

(a) Municipal Solid Waste (MSW) likely to be generated during construction and operation shall be 90 Ton/annum and 30 ton/annum respectively which shall be managed as per Solid Wastes Management Rules, 2016.

(b) Hazardous waste: It inter alia includes burnt mobile oil and greases (15 ton/annum) from vehicles and construction machinery and equipment which shall be handled and disposed of through authorized dealer as per Hazardous and other Wastes (Management & Transboundary Movement) Rules, 2016.

(c) The total quantity of muck / debris, to be generated due to the project, shall be 28.93 lakh cum, of which 23.15 lakh cum shall be consumed on project work and balance 5.78 lakh cum shall be dumped at designated muck sites. Muck piles shall be well supported at base by retaining walls and multi-storied plantation will be developed using grasses, shrubs, bushes, and trees in a site-specific manner.

xv. **Status of Litigation Pending against the proposal, if any:** None

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

- **Project details:**

Name of the Proposal	Aruna PSP (1500 MW), District Kolhapur & Sindhudurg, Maharashtra

	Proposal No.: IA/MH/RIV/574543/2026 File No. J-12011/19/2026-IA. I(R)
Location (Including coordinates)	Upper Dam: Village Vesaraf Village, Tahsil Bavda, Distri ct Kolhapur Lower Dam: Mounde Village, Tahsil Vaibhavwadi, District Sindhudurg Upper Reservoir: 16°35'39.87"N, 73°51'19.51"E Lower Reservoir: 16°36'32.43"N, 73°50'37.75"E
Inter- state issue involved	No
Seismic zone	Zone -III

- **Category details:**

Category of the project	A
Provisions	Project activity covered at S.N.1(c)(i)(c) Standalone Pumped Storage Project
Capacity / Cultural command area (CCA)	1500 MW/ 9000 MWH pumped storage component with 6 hours storage capacity for peak power generation and 6.86 hours pumping operation for backfilling of upper reservoir of PSP.
Attracts the General Conditions (Yes/No)	No
Additional information (if any)	MoU was signed between M/s THDCIL and Department of Water Resources, Govt. of Maharashtra on 03rd day of September 2024, for establishment of Aruna PSP.

- **Electricity generation capacity:**

Powerhouse Installed Capacity	1500 MW
Generation of Electricity Annually	3120.75 MU
No. of Units	6x250MW
Additional information (if any)	The project with installed capacity of 1500 MW(6x250MW) by utilizing a design discharge of 499.21 cumec rated net head of 338m for 6-hour daily peaking cycle will annually generate 3120.75 MU. The PSP will utilize 1650 MW to pump 435.86 cumec from lower reservoir to the upper reservoir in 6.86 hours.

- **ToR/EC Details:**

<table>
<tr><td>Cost of project</td><td>Rs 9126.10 Crores.</td></tr>
<tr><td>Total area of Project</td><td>334.45 ha</td></tr>
<tr><td>Height of Dam from River Bed (EL)</td><td>Upper Dam-45 m; Lower Dam-69 m</td></tr>
<tr><td>Length of Tunnel/Channel</td><td>Length: 5353.80m comprising of following components:
(i) Pressure Shaft :3827.79 m (Main:623.55+Br.: 3204.24
(ii)TRT: 1026.81 m (3x342.27m)
(iii) Draft tube tunnels: 499.20m (6x 83.20m)</td></tr>
<tr><td>Details of Submergence area</td><td>Total Submergence area- 127.81 ha (Forest land: 117.81 ha, non-Forest land: 10 ha)</td></tr>
<tr><td>Types of Waste and quantity of generation during construction/ Operation</td><td><table>
<tr><th>Waste Type</th><th>Construction (TPA)</th><th>Operation (TPA)</th></tr>
<tr><td>MSW</td><td>90</td><td>30</td></tr>
<tr><td>Plastic</td><td>15.0</td><td>1.0</td></tr>
<tr><td>E-waste</td><td>2.0</td><td>0.20</td></tr>
<tr><td>Burnt oil</td><td>15.0</td><td>2.00</td></tr>
<tr><td>Batteries</td><td>5.0</td><td>0.50</td></tr>
<tr><td>Bio-medical</td><td>4.0</td><td>2.0</td></tr>
</table></td></tr>
<tr><td>E-Flows for the Project</td><td></td></tr>
<tr><td>Is Projects earlier studies in Cumulative Impact assessment & Carrying Capacity studies (CIA&CC) for River in which project located. If yes, then
a) E-flow with TOR /Recommendation by EAC as per CIA&CC study of River Basin.
b) If not the E-Flows maintain criteria for sustaining river ecosystem.</td><td>No

Not applicable

Not applicable in case of PSP</td></tr>
<tr><td>No. of trees/saplings proposed in view of ‘Ek Ped Maa Ke Naam’ campaign</td><td>150</td></tr>
</table>

- **Muck Management Details:**

No. of proposed disposal area/ (type of land- Forest/Pvt land)	Muck Disposal Sites-2 Nos Area and Type of land -19 ha (non-forest)

Muck Management Plan	The muck shall be laid with vertical angle not exceeding 28^0 in such a manner that rock mass is properly stacked behind the gabion wall/revetment with minimum of voids. The muck pile shall be later covered with geo-Geo-coir textile and rehabilitated by afforestation of herbs and shrubs. Detailed Muck Management Plan shall be formulated during EIA study.
Monitoring mechanism for Muck Disposal	The project authorities shall erect a barrier to regulate the traffic flow to and fro the muck piles site. Proper e-challan shall be issued.

- **Land Area Breakup:**

Private land	50.00
Government land	210.85
Forest Land	73.60 ha
Total Land	334.45 ha
Submergence area/Reservoir area	127.81 ha
Additional information (if any)	Land for transmission line for power evacuation (RoW) is not included.

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

Forest Land/ Protected Area/ Environmental Sensitivity Zone	**Yes/No**	**Details of Certificate/ letter/Remarks**
Reserve Forest/Protected Forest Land	Yes	Vesaraf, Aslaj, Bhom and Mounde R/F
National Park	No	None within 10km
Wildlife Sanctuary	No	None within 10km.

- **Court case details:** Nil

- **Previous EC compliance and necessary approvals:**

Particulars	**Letter no. and date**
Certified EC compliance report (if applicable)	Not applicable
Status of Stage- I FC	Not, yet
Additional detail (If any)	Application for diversion of forest land shall be moved
Is FRA (2006) done for FC-I	Not, yet

- **Miscellaneous:**

Particulars	Details
Details of consultant	EQMS Global Private Limited 305, 3rd Floor, Plot No. 16, Rishabh Corporate Tower, Community Centre, Karkardooma, Delhi – 110092 Phone: 011-43062757; NABET/EIA/25-28/RA0465, valid up to 23.11.2028.)
Project Benefits	The benefits inter alia shall include the benefits like (i) Average annual generation of 3120.75 MU of energy; (ii) Increased vegetal cover due to implementing of CAT Plan and Green Belt Development Plans (iii) Employment Potential during construction (1500 labour); (iv) Overall development of area by implementing CSR initiatives and Watershed Development Plans.
Status of other statutory clearances	The mandatory statutory clearance like approval of power potential studies from CEA, site specific earthquake design parameters to be approved by NCSDP, Geological report approval from GSI, DPR approval from CWC and CEA; Forest clearance for diversion of forest land, are yet to be sought.
R&R details	R&R details shall be finalised later.
Additional detail (If any)	None

53.3.5 The EAC during deliberations noted the following:

- The Expert Appraisal Committee (EAC) deliberated on the information submitted (Form 1, PFR, kml file, etc.) and as presented in the meeting and observed that the proposal is for grant of TOR for conducting EIA/EMP and Public hearing for Aruna Open Loop Pumped Storage Project (1500 MW) in an area of 334.45 Ha located Sub District Bavda and Vaibhavvadi, District Kolhapur and Sindhudurg, Maharashtra by M/s THDC India Limited.

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

- The EAC observed that the upper dam will be located across a small stream draining into Kumbhi river near Vesaraf village and the lower dam will be located on a small stream draining into Aruna River near Mounde village since both of the reservoirs are located on small stream therefore, the project is termed as Open Loop project.

- The EAC noted that the total land requirement for the proposed project is estimated to be approximately 334.45 ha, of which about 73.60 ha falls within forest land, while the remaining 260.85 ha is non forest land. Diversion of forest land for non-forest purpose will be involved for construction of project components. However, it was observed that the application for Stage-I Forest Clearance (FC) has not yet been submitted, which necessitates further action from the Project Proponent.

- The committee noted that the quantity of water required during construction is estimated as 1230 kld (Construction-1100 kld; Domestic-130kld) and during operation shall be 50kld, which shall be drawn from catchment of local nallas. The initial filling requirement (13.58MCM) of lower reservoir shall be met from rainfall yield of catchment (4.67sq km) in two monsoon seasons besides annual recoupment of evaporation losses and transit losses of both reservoirs 1.165 MCM (0.711+0.454).

- The EAC observed that Radhanagari Wildlife Sanctuary and its Eco-Sensitive Zone (ESZ) are located approximately 12.48 km and 7.03 km, respectively, from the nearest project boundary. The upper reservoir falls within Gaganbawada Conservation Reserve. Further, the project villages, namely Vesaraf and Mounde, are situated within the Western Ghats Eco-Sensitive Area (ESA) as per Draft Notification S.O. 3060(E) dated 31.07.2024. The Committee also noted that no archaeological monument of national importance or national heritage structure exists within the project or submergence area, and no inter-state or international boundary lies within 10 km of the project boundary.

- The EAC observed that Memorandum of Understanding was signed between M/s THDCIL with Water Resources Department, Govt. of Maharashtra on 03.09.2024 for the establishment of Aruna Pumped Storage Project (1950 MW). However, the present proposal submitted by the PP envisages a decreases capacity of 1500 MW. In view of the substantial decrease in the proposed capacity, the Committee opined that an amendment/revision of the existing MoU shall be required to align it with the revised project configuration.

53.3.4 The EAC based on the information submitted and as presented during the meeting, recommended the proposal for grant of Specific ToR issued by the Ministry for Open Loop Pumped Storage Projects vide OM dated 14.08.2023 for conducting EIA study for proposed construction of the project for Aruna Open Loop Pumped Storage Project (1500 MW) in an area of 334.45 Ha located Sub District Bavda and Vaibhavvadi, District Kolhapur and Sindhudurg, Maharashtra by M/s THDC India Limited, under the provisions of EIA Notification, 2006, as amended along with the following additional/specific ToR:

[A] Environmental Management and Biodiversity Conservation:

i. PP shall obtain amendment/revision of the existing MoU to reflect the revised project capacity of 1500 MW,

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

iii. The PP will submit 10 years water availability data certified by the CWC/State Water Resource Department for quantity of water that is received annually by the small stream on which lower reservoir is proposed to be constructed.

iv. The PP will submit a detailed plan and monitoring mechanism for releasing the self - catchment water of small stream draining in to river along with action plan for conservation and protection of other streams/rivulets draining in to upper and lower reservoirs.

v. Explore the possibilities for reducing the Forest land requirement. The application for obtaining Stage I FC for 73.60 ha of forest land involved in the project shall be submitted within stipulated time.

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

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

viii. Transportation Plan for transporting construction materials shall be submitted. Separate chapter for risk assessment of such transportation through/within proposed the Wildlife Sanctuary shall be included in the EIA report, if any.

ix. 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.

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

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

xii. The longitudinal connectivity/Free flowing sketch be provided in the EIA/EMP report.

xiii. 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.

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

xv. Action plan for survival or diversion of the rivulets/stream, if any, leading to join river shall be submitted.

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

xvii. 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.

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

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

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

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

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

xxiii. The EAC site visit shall be conducted before considering the proposal for grant of Environmental Clearance in view of project location in Western Ghats.

[B] Socio-economic Study:

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

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

iii. The EIA/EMP shall include a detailed socio-economic assessment of the tribal population in the project-affected area based on primary data and community consultations. A Tribal Development Plan, prepared in consultation with the District Administration and Tribal Welfare Department, shall be submitted along with the EIA report.

iv. 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.

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

[C] Muck Management:

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

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

iii. Safety measures for avoiding spill over muck into the riverbed/streams and its flow into the river during the high discharge/ flood or monsoon period. Prepare plan for stabilization of muck disposal sites using biological and engineering measures to ensure

that muck does not roll down the slopes and shall be disposed safely and that it does not pollute the natural streams and water bodies in surrounding area.

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

[D] Disaster Management:

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

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

[E] Miscellaneous:

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

ii. PP shall follow all the terms and conditions mentioned in draft notification issued by MOEF&CC vide S.O.3060(E) dated 31.07.2024 of Western Ghats ESA for preparation of EIA/EMP report.

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

iv. 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.

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

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

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

viii. As per Ministry's OM dated 1st August, 2013, PP shall submit application to obtain prior approval of Central Government under the Forest Conservation Act, 1980 for diversion of forest land required for such projects will be submitted as soon as the actual extent of forest land required for the project is known to the project proponent,

and in any case, within 6 months of issuance of ToR. However, no proposal will be put up before EAC without submission of application for forest clearance, wherever applicable.

ix. PP shall provide details of acquisition of land for the proposed project as per OM no. 22-76/2014-IA.III dated 07.10.2014.

Agenda Item No. 53.6

Barnar Reservoir Project (CCA of 22,226 Ha) in an area 1052.43 Ha located at Sub-district Sono, Khaira, and Gidhaur etc., District Jamui, Bihar by M/s M/s Water Resources Department, Bhagalpur, Bihar – Terms of References (TOR) – reg.

[Proposal No. IA/BR/RIV/569952/2026; F. No. J-12011/20/2026-IA.I(R)]

51.7.1 The proposal is for grant of Terms of Reference (TOR) to the project Barnar Reservoir Project (CCA of 22,226 Ha) in an area 1052.43 Ha located at Sub-district Sono, Khaira, and Gidhaur etc., District Jamui, Bihar by M/s M/s Water Resources Department, Bhagalpur, Bihar.

51.7.2 The Project Proponent and the accredited Consultant M/s Rian Enviro Private Limited, made a detailed presentation on the salient features of the project and informed that:

i. The proposed irrigation project on the Barnar River is located in Sono Block of Jamui District, Bihar. The project envisages the construction of a dam across the Barnar River near Kataharatand Village in Sono Block, Jamui District, along with the development of two irrigation canals, namely the Left Main Canal and the Right Main Canal.

ii. The proposed irrigation project on the Barnar River is located in Sono Block of Jamui District, Bihar. The project is owned by the Government of Bihar and is being implemented through the Executive Engineer, Irrigation division, Jhajha, Jamui, Bihar. The project envisages the construction of a dam across the Barnar River near Kataharatand Village in Sono Block, Jamui District. The project qualifies as a Major Irrigation Project, with a Culturable Command Area (CCA) of 22,226 hectares and a Gross Command Area (GCA) of 31,781 hectares.

iii. The project components are as under:

- **Reservoir Storage and Water Availability**

The proposed concrete gravity dam of 75.65 m height at Kataharatanr village near Batiya village will create a reservoir with a gross storage capacity of 8021 ha·m. The reservoir storage has been assessed to be sufficient to meet the irrigation water

requirement of the command area after accounting for losses due to evaporation, seepage, and operational requirements. Live storage shall be optimally utilized through regulated releases into the canal system based on seasonal irrigation demand, reservoir inflow pattern, and crop water requirements. The reservoir operation plan will ensure equitable and efficient distribution of water while maintaining downstream environmental flows.

- **Canal System and Conveyance Planning**

The irrigation water from the reservoir will be conveyed through two main canals, namely the Left Main Canal (LMC) and the Right Main Canal (RMC), both taking off at the same elevation of 170.67 m (559.80 ft). The common off-take level ensures uniform hydraulic control and simplifies operational management.

- Left Main Canal (LMC): The LMC has a total length of 24.91 km and traverses the command area on the left side of the dam. It ultimately outfalls into the Bunbuni River, a tributary of the Kiul River, at chainage 822. The canal is designed as a fully lined canal to reduce seepage losses, prevent erosion, and ensure reliable conveyance over its longer alignment.
- Right Main Canal (RMC): The RMC, with a total length of 17.21 km, serves the right-side command area and finally discharges into the Ulai River. Like the LMC, the RMC is also proposed as a lined canal to achieve higher conveyance efficiency and lower maintenance requirements.

The canal alignment has been planned along natural contours as far as possible to minimize earthwork, reduce land acquisition, and avoid forest land and environmentally sensitive areas.

- **Distribution Network and Command Area Development:** From the main canals, irrigation water will be distributed through a network of distributaries, minors, and field channels to ensure effective coverage of the cultivable command area.

iv. The geographical co-ordinate of the project are:

Particular	Latitude	Longitude
Dam Site	24°37'18.53"N	86°19'22.80"E
Left Main Canal end	24°42'53.70"N,	86°11'28.47"E
Right Main Canal end	24°43'16.97"N	86°22'41.89"E

v. The Barnar Reservoir Project in District Jamui, Bihar Project envisages construction of:

1. Dam structure
2. Left and Right Main canal
3. Pipe distribution network from main canal

4. Housing colony for staffs

vi. **Land requirement:**

Sl no	Project Component	Non-forest land (Ha)	Forest Land (Ha)	Total Land (Ha)
1	Dam Axis	-	3.43	3.43
2	Approach Roads	-	11.26	11.26
3	Dam maintenance	-	16.64	16.64
4	Submergence	-	409.95	409.95
5	Right & Left Main Canals	232.23	10.99	243.22
6	Pipe distribution network*	354.43	5.21	359.64
7	R&R Land	3.80	-	3.80
8	Muck Dumping Yard	3.80	-	3.80
9	Colony (Permanent & Temporary Buildings)	0.70	-	0.70
	Total	**594.96**	**457.48**	**1052.43**

vii. **Water requirement:** Gross storage capacity of the reservoir is 8021 Ha·m.

viii. **Project Cost:** The estimated project cost is Rs 257937.85 lakhs Total capital cost earmarked towards environmental management plan is Recurring cost (operation and maintenance) will be submitted with EIA/EMP Report.

ix. **Environmental Sensitive area:** There is Occasional Elephant movement is between the Garhi beat of Jamui range, Charkapatthar and Batia beats of Jhaja range and Madhwa sub-beat of Chakai range within 10 km distance from the project site.

x. **Alternative Studies:** The Barnar Irrigation Project is a long-pending initiative, where construction started in 1975. However, due to various financial constraints, the project work was subsequently halted. The State Government of Bihar has now formulated a comprehensive plan to revive and complete the project. Consequently, no alternative project sites were explored, as the original site remains the most suitable. The Barnar River enters Jamui District through a narrow gorge near Kataharatand Village, which provides a geologically and geomorphologically suitable location for a dam. Considering this favorable site, and to provide irrigation to the drought-prone blocks of Sono, Jhajha, Gidhaur, Khaira, and Jamui, the concept of constructing the Barnar Dam was developed.

xi. **Details of Solid waste/ Hazardous waste generation/ Muck and its management:** Estimated quantity of muck is 204824 cum.

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

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

- **Project details:**

<table>
<tr><td>Name of the Proposal</td><td>Barnar Reservoir Project in District Jamui, Bihar</td></tr>
<tr><td>Proposal No.</td><td>IA/BR/RIV/569952/2026</td></tr>
<tr><td>Location
(Including Coordinates)</td><td>Sub-district Sono, Khaira, and Gidhaur etc., District Jamui, Bihar

<table><tr><th>Component</th><th>Latitude</th><th>Longitude</th></tr><tr><td>Dam Site/Canals Starting Points</td><td>24°37'18.53"N</td><td>86°19'22.80"E</td></tr><tr><td>Ending of Left Main Canal</td><td>24°42'53.70"N</td><td>86°11'28.47"E</td></tr><tr><td>Ending of Right Main Canal</td><td>24°43'16.97"N</td><td>86°22'41.89"E</td></tr></table></td></tr>
<tr><td>Inter- state issue involved</td><td>No</td></tr>
<tr><td>Seismic zone</td><td>IV</td></tr>
</table>

- **Category details:**

Category of the project	A
Provisions	Project Activity covered under S.No, 1(c) (ii) (c) Major Irrigation system with applicability of General condition
Capacity / Cultural command area (CCA)	CCA of 22,226 Ha
Attracts the General Conditions (Yes/No)	Yes Bihar-Jharkhand Interstate Boundary ~ 4 km in South from the Dam Site; ~ 400m in South from the Reservoir Boundary
Additional information (if any)	Nil

- **ToR/EC Details:**

Cost of project	₹ 257937.85 lakhs
Total area of Project	Culturable Command Area (CCA) of 22,226 Ha
Height of Dam from River Bed (EL)	76.75 m
Length of Tunnel/Channel	Left canal - 24.91 K.M., Right canal - 17.21 K.M
Details of Submergence area	409.95 Ha
Types of Waste and quantity of generation during construction/ Operation	Muck 204824 cum in Bulk Volume
E-Flows for the Project	Will be provided with the EIA/EMP Report
Is Projects earlier studies in Cumulative Impact assessment & Carrying Capacity studies (CIA&CC) for River in which project located. If yes, then a) E-flow with TOR /Recommendation by EAC as per CIA&CC study of River Basin. b) If not the E-Flows maintain criteria for sustaining river ecosystem.	No
No. of trees/saplings proposed in view of 'Ek Ped Maa Ke Naam' campaign	Will be provided with EIA/EMP Report

- **Muck Management Details:**

No. of proposed disposal area/ (type of land-Forest/Pvt. land)	3.80 ha of non-forest land has been identified
Muck Management Plan	Will be provided with EIA/EMP Report

Monitoring mechanism for Muck Disposal	Will be provided with EIA/EMP Report

- **Land Area Breakup:**

Private Land	586.65 Ha
Government land	8.29 Ha
Forest Land	457.48 Ha
Total Land	1052.43 Ha
Submergence area/Reservoir area	409.95 Ha
Additional information (if any)	-

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

Forest Land/ Protected Area/ Environmental Sensitivity Zone	**Yes/No**	**Details of Certificate / letter/Remarks**
Reserve Forest/Protected Forest Land	Yes	The submergence area is falling under the reserve forest area.
National Park	No	
Wildlife Sanctuary	No	

- **Court case details: Nil**

- **Miscellaneous**

Particulars	**Details**
Details of consultant	Rian Enviro Private Limited, Patna, Bihar NABET Certificate No NABET/EIA/24-27/RA 0368 (Ver. 02) Valid Upto – 11/09/2027 Category-A EIA Consultant Contact Person – Mr Muzaffar Ahmad/ Mr Bhuwan Bhaskar Mobile : 8368193684/7836916696
Project Benefits	The project will help the dry areas of Jamui districts by providing improved irrigation facilities, and a portion of the command area may support cultivation during two cropping seasons.
Status of other statutory clearances	Application for the Forest Clearance submitted.

R&R details	Under progress. Will be submitted with EIA/EMP Report
Additional detail (If any)	Nil

53.6.3 The EAC during deliberations noted the following:

- The EAC deliberated on the information submitted (Form 1, PFR, kml file, etc.) and as presented in the meeting and observed that the proposal is for grant of TOR for conducting EIA study for Barnar Reservoir Project (CCA of 22,226 Ha) in an area 1052.43 Ha located at Sub-district Sono, Khaira, and Gidhaur etc., District Jamui, Bihar by M/s M/s Water Resources Department, Bhagalpur, Bihar.

- The EAC noted that the present project proposal comes under "B1" category; as per the provisions of the EIA Notification, 2006, as amended as Culturable Command Area (CCA 22,226 Ha). However, the project is located at proximity to the Bihar–Jharkhand inter-state boundary, it requires appraisal at the Central level by the Expert Appraisal Committee (EAC).

- The Committee took cognizance of the proposal involving construction of a dam near Kataharatand Village with a Culturable Command Area (CCA) of 22,226 hectares and a Gross Command Area (GCA) of 31,781 hectares.

- The EAC deliberated on the proposal and noted that the irrigation project is a long-pending initiative of the Government of Bihar aimed at addressing recurrent drought conditions and flash flood events in the Jamui district caused by highly variable rainfall patterns. The Committee observed that, although the Barnar River is seasonal in nature, the proposed intervention for storage and regulated utilization of monsoon flows is expected to enhance water availability and expand the culturable command area, thereby supporting sustainable agricultural practices.

- The Committee recognized the potential socio-economic benefits of the project, including improved irrigation reliability for Kharif and Rabi crops, increased agricultural productivity, and enhanced livelihood opportunities for the local population. However, the EAC emphasized the need for detailed assessment of hydrological sustainability, downstream flow requirements, and environmental safeguards to ensure minimal ecological impact.

- The EAC noted that the total land required for the project is estimated to be 1052.43 ha. Out of which, 594.96 ha is Non-forest land and 457.48 ha is Forest Land. Diversion of forest land for non-forest purpose will be involved for construction of project

components. However, it was observed that the application for Stage-I Forest Clearance (FC) has not yet been submitted, which necessitates further action from the Project Proponent.

- It was further noted that there are No national parks, wildlife sanctuaries, Biosphere Reserves, Tiger/Elephant Reserves, Wildlife Corridors etc. within 10 km distance from the project site. However, there is occasional Elephant movement is between the Garhi beat of Jamui range, Charkapatthar and Batia beats of Jhaja range and Madhwa sub-beat of Chakai range within 10 km distance from the project site. In view of the presence of Elephant corridor in the submergence area of the proposed project, the EAC opined that PP shall prepare a detailed Wildlife Conservation Plan with specific focus on ensuring safe and unhindered movement of elephants in the landscape. The Plan shall include mitigation measures such as habitat connectivity, avoidance of barrier effects, and monitoring mechanisms, and must be duly approved by the Chief Wildlife Warden.

53.6.4 The EAC based on the information submitted and as presented during the meeting, recommended the proposal for grant of Standard ToR issued by the Ministry for conducting EIA/EMP study with Public consultation for Barnar Reservoir Project (CCA of 22,226 Ha) in an area 1052.43 Ha located at Sub-district Sono, Khaira, and Gidhaur etc., District Jamui, Bihar by M/s M/s Water Resources Department, Bhagalpur, Bihar, under the provisions of EIA Notification, 2006, as amended along with the following additional/specific ToR.

[A] Environmental Management and Biodiversity Conservation:

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

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

iii. The habitat fragmentation effects shall be studied in consultation with WII/expert government research institute in terms of edge effects, increased competition, lower biodiversity, human-wildlife conflict and reduced access to resource.

iv. A detailed wildlife conservation plan for Schedule –I species along with mitigation measures for minimizing the human–animal conflict and safe movement of elephants in the identified corridor, duly approved by the Chief Wildlife Warden, be submitted.

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

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

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

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

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

x. PP shall prepare detailed plan for Plantation of saplings under the tree plantation campaign "Ek Ped Ma Ke Naam".

[B] Socio-economic Study:

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

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

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

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

v. Tentative no. of project affected families shall be identified and accordingly

appropriate Rehabilitation & Resettlement plan shall be prepared.

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

[C] Muck Management:

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

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

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

[D] Miscellaneous:

i. Pre-DPR Chapters viz. Hydrology, Layout Map Studies duly approved by CWC shall be submitted.

ii. PP shall obtain clearance from the inter-State aspect from the designated authorities as per the procedure.

iii. PP shall provide details of acquisition of land for the proposed project as per OM no. 22-76/2014-IA.III dated 07.10.2014.

iv. 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.

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

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

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

<u>Agenda Item No. 53.7</u>

Niare Hydro Electric Project (909 MW) in an area of 175.05 Ha located at Sub-district Limeking Circle, District Upper Subansiri, Arunachal Pradesh by M/s Andra Power Private Limited – Terms of References (TOR) – reg.

[Proposal No. IA/AR/RIV/573804/2026; F. No. J-12011/21/2026-IA.I(R)]

52.3.1 The proposal is for grant of Terms of Reference (TOR) to the project Niare Hydro Electric Project (909 MW) in an area of 175.05 Ha located at Sub-district Limeking Circle, District Upper Subansiri, Arunachal Pradesh by M/s Andra Power Private Limited.

52.3.2 The Project Proponent and the accredited Consultant R. S. Envirolink Technologies Private Limited, made a detailed presentation on the salient features of the project and informed that:

i. Niare Hydro Electric Project is proposed as a run-of-river scheme across Subansiri River, a major right bank tributary of River Brahmaputra. The project envisages the construction of about 149.50 m high Concrete Gravity Dam above the deepest Foundation level near Niare village 50 km upstream of Nacho town in Upper Subansiri District of Arunachal Pradesh. The installed capacity of the project has been proposed as 909 MW (810 MW + 99 MW) with a rated net head of 186.36 m and a design discharge of 484 cumecs for Main Scheme and 89.53m and 123.05 cumecs for Auxiliary Scheme.

ii. The dam site is located about 4.8 km downstream of the Hari Chu Nallah confluence with Subansiri at Longitude 93°31'13.45" E and Latitude 28°21'33.87" N. The river bed level at dam location is EL. 1160.00m. The main considerations for selection of this site are having sufficient river width, river profile is considerably straight on the upstream as well as downstream, less left bank excavation and suitable location is available for the intake. Adequate working space is also available for the project construction activities.

iii. Niare Hydro Electric Project envisages the following project components: A Concrete gravity dam of 149.50m height with crest length of 151.36m which comprises of 9 numbers of blocks including 3 Nos. of Sluice Spillway, 1 No. of Surface Spillway & 5 Nos. of Non-Overflow blocks (3 blocks on Left Bank & 2 blocks on right bank) has been proposed. A Ski jump with preformed plunge pool has been proposed at the downstream of Spillway blocks for Energy dissipation arrangement.

iv. Earlier TOR & Post-TOR Activities
   - The Project was recommended for grant of TOR during the 11th EAC Meeting held on 06 May 2021.
   - TOR was issued by MoEF&CC vide letter dated 04 June 2021 for an installed capacity of 870 MW.
   - Post-TOR, Survey & Investigation, DPR preparation, and EIA studies were initiated.

- Land requirement at the time of earlier TOR was 429.585 Ha; revised to 175.05 Ha after layout finalization due to reduction in FRL — a reduction of 254.5 Ha (59%).
- The entire land is categorized as Unclassed State Forest (USF) and private land. A forest diversion application has been filed vide Proposal No. FP/AR/HYD/IRRIG/559610/2025 dated 26 November 2025 for 175.05 Ha.
- An amendment in TOR application was filed vide Proposal No. IA/AR/RIV/571878/2026 dated 17 March 2026; however, since the earlier TOR is expiring on 03 June 2026, a fresh TOR application has been filed.

v. The geographical co-ordinate of the project are:

Dam Site: Longitude 93°31'13.45" E and Latitude 28°21'33.87" N.
Powerhouse Site: Longitude 93^0 32' 48.08" E and Latitude 28^0 22' 02.13" N.

vi. **Land requirement:**

Forest Land : 175.05 ha (Unclassed State Forest)
Non-forest Land : 0 ha
Total Land : 175.05 Ha

vii. **Demographic details within 10 km radius of the project area:**

- The villages located in and around the project area are small, dispersed, and predominantly dependent on agriculture. Overall population density is lower than the state average.
- Most residents rely on farming, livestock rearing, fishing, and daily wage labour for their livelihood.
- Although basic amenities such as primary health centres and schools are available, while advanced medical and higher education facilities are lacking. Road connectivity is poor with limited transport.
- The major tribes inhabiting the project area include the Tagin, Nyishi, Hill Miri, and Galo communities. These ethnic groups typically reside in small settlements locally known as 'busthi'.
- The major festivals of the district include Si-Donyi, Boori-Yullo, Boori-Boot, and Mopin, celebrated by the Tagin, Nyishi, Hill Miri, and Galo communities, respectively.
- Major crops include jhum paddy, maize, soybean, linseed, and mustard, along with fruits like mandarin orange, pineapple, banana, and lemon.

Parameters	Nyare	Limeking H.Q.	Ngus (Orak)	Mepu	Nilo
Households	1	62	11	2	42
Total Population	3	376	46	9	249
Male Population	0	240	21	5	116

Female Population	3	136	25	4	133
Scheduled Caste (SC) Pop.	0	0	0	0	0
Scheduled Tribe (ST) Pop.	3	250	46	9	249

(Source: Census 2011)

- Limeking HQ is the largest settlement with 62 households with a population of 376, followed by Nilo village with 249 people in 42 households.
- Ngus (Orak) has a moderate population of 46 people across 11 households, whereas Mepu and Nyare are the smallest villages, with populations of 9 and 3 respectively.
- Across all villages, the male and female populations are generally well balanced, except in Limeking HQ, which has 240 males and 136 females' population.
- The presence of Scheduled Caste (SC) communities is negligible across all villages.
- All villages are predominantly inhabited by Scheduled Tribe (ST) populations, except Limeking HQ village, where about 66.48% of the population belongs to Scheduled Tribe communities.

viii. **Water requirement:**

Live Storage: 6.75 MCM
Design Discharge – 484 Cumec
Annual yield:13594 MCM

ix. **Project Cost:** The estimated project cost is Rs 8477.67 crore. Total capital cost earmarked towards environmental pollution control measures will be worked out during EIA study as well as the Recurring cost (operation and maintenance).

x. **Project Benefit:** Total Employment will be 2000 persons as direct & 4000 persons indirect during construction and 200 persons as direct & 400 persons as indirect during operation.

xi. **Environmental Sensitive area:** No project component falls in any notified protected area. Nearest Protected Nidak Danyi Wildlife Sanctuary is the nearest protected area and is about 70 Km from the project site.

xii. **MoU / any other clearance/ permission signed with State government:** MoU signed with State Government on 26th April 2011.

xiii. **Resettlement and rehabilitation:** The forest land proposed for diversion has been categorized as Unclassed State Forest. Entire land is also considered as community land, therefore R&R plan will be prepared to compensate for the acquisition of

175.05 ha of land.

xiv. **Alternative Studies:**

Four alternative sites have been selected/studied and following aspects were taken into consideration while finalizing the **dam location**:

- Straight reach on the upstream as well as downstream of dam axis
- Sufficient width of river valley to accommodate design flood
- Geological & Geotechnical Parameters
- Hydraulic considerations and minimum drawdown level (MDDL) in relation to power intake invert level
- Crest level of Sluice Spillway vis-à-vis power intake level from sediment management consideration
- Narrow gorge on both banks for reducing the length of dam along the axis
- Selection of the dam site based on environmental considerations and forest impacts
- The chosen site offers relatively lower forest density, minimal vegetation loss, and limited impact on local flora and fauna
- Consider the dam site by avoiding reserve forest land requirement, and not fall in wildlife area & its Eco-Sensitive Zone

Description	**Alternative-1**	**Alternative-2**	**Alternative-3 (Selected)**	**Alternative-4**
Location of Dam axis	D/s of Riyo Siko Nallah (As per PFR NHPC)	800m D/s of Alternative-1 (i.e. 800m U/s of Imisa Siko nallah)	300m D/s of Alternative-2 (i.e. 500m U/s of Imisa Siko nallah)	150m D/s of Alternative-2 (i.e. 650m U/s of Imisa Siko nallah)
S-Bend	140m U/s & 235 D/s	200m U/s	500m U/s	350m U/s
Straight reach available on U/s & D/s	140m & Not available	200m & Available (800m up to confluence)	500m & Available (500m up to confluence)	350m & Available (650m up to confluence)
Dam top length	269m	175.06m	151.36m	209m
Riverbed level	EL.1200m	EL.1168m	EL.1160m	EL.1165m
FRL	EL.1259m	EL.1259m	EL.1259m	EL.1259m
Free Stretch	Not available	Available	Available	Available
No. of total Dam Blocks	18	10	10	12

Functioning of Spillways & Effective sediment management	Not met	Not met	Met	Met
Presence of Nallah at Secondary Powerhouse location	No	No	No	Yes
Left bank Excavation	Less	Large	Less	Large
Construction Time	Require additional time	Require additional time	Can be completed in time	Require additional time
Type of Forest land affected	Unclassed State Forest	Unclassed State Forest	Unclassed State Forest	Unclassed State Forest
Description	Alternative-1	Alternative-2	Alternative-3	Alternative-4
Total Land Requirement	180.5	185	175.05	190

Alternate Study for Powerhouse Site

- Alternative studies have been carried out for locating the powerhouse by keeping the dam at Alternative-3 (FRL at 1259m with the normal TWL of 1051m).
- Three underground alternatives have been studied to minimize the impact on Environment & Forest.
- These sites have been studied in detail and the comparison has been made considering the major aspects of all alternatives and the comparison table is given below:

Particulars	**Alternative-I**	**Alternative-II**	**Alternative-III**
Location of powerhouse	Left Bank Opposite to Muri Village & D/s of Nayaki Siko Nala (0.93km away)	Left Bank Opposite to Orak Village & D/s of Amego Nala (0.45km away)	Left Bank Opposite to Orak Village & D/s of Dapak Karo Sako Nala (0.25km away)
Length of Headrace tunnel	2.2Km	3.4km	4.1km
Type of U/s Surge Shaft	Underground Chamber	Underground Chamber	Open to Sky
Dimension of Powerhouse Cavern	151.125m (L) x 23.5m (W) x 55.20m(H)	151.125m (L) x 23.5m (W) x 55.20m(H)	161.125m (L) x 23.5m (W) x 53.60m(H)
Dimension of Transformer cavern	151.125m (L) x 23.5m (W) x 55.20m(H)	151.125m (L) x 16.00m (W) x 32.90m(H)	161.125m(L) x 16m(W) x 28.50m (H)
Dimension of D/s collection gallery	118m (L) x 16m (W) x 50m (H)	118m (L) x 16m (W) x 50m (H)	118m (L) x 16m (W) x 50m (H)

Total length of tunnelling	2161.71m	1023m	1023m
Geological strata	Overburden of 35m-40m near Surge Shaft & Access Adits area	Rock Strata	Rock Strata
Presence of Nallahs	No	Yes (Three Nallahs)	Yes (Two Nallahs) – U/s Seasonal 235m away & 360m away D/s
Ingress of Water inside the Caverns	No	Yes	No
Total Length of Tailrace tunnel	1.82 Km	0.74Km	0.52Km
Construction Time	Require additional time	Require additional time	Can be completed in time
Type of Forest Land affected	Unclassed State Forest	Unclassed State Forest	Unclassed State Forest
Total Forest Land required	190.45	180.25	175.05

The alternate studies for selecting Dam and Powerhouse site were discussed in detail with CEA, CWC, GSI & CSMRS, and best techno-economical alternative coupled with environmental considerations was selected.

The selected site is not only geologically, technically, economically more viable but also most friendly from environment & forest angle due to following reasons:

- Presents better geological condition due to hard, compact, medium to coarse grained granite gneiss composed of quartz, feldspars, kyanite & sillimanite in the proposed dam complex area.
- There is no evidence of hill slope instability along both abutments, and selected site appears to be geologically stable.
- The dam site has been carefully selected at a location where rock outcrops are exposed on both banks, thereby significantly reducing the requirement of tree felling.
- The reservoir stretch also predominantly covers rocky and sparsely vegetated terrain, minimizing the impact on dense forest cover.
- The major project components such as the powerhouse, head race tunnel (HRT), and switchyard facilities are proposed to be constructed underground, thereby ensuring least possible disturbance to the surface forest area
- The selected site does not require any reserve forest land.
- The selected site located in relatively less forest cover, and as such involves no displacement of families or settlement.

- The selected site does not fall in the 10 Km radius of any wildlife sanctuary/ national park and its Eco-Sensitive Zone.
- The selected site duly incorporates the recommendations made in the already approved Cumulative Impact Assessment (CIA) and Carrying Capacity Studies (CCS) of the Subansiri river basin.

xv. **Status of Litigation Pending against the proposal, if any** : NA

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

- **Project details:**

Name of the Proposal	Niare Hydroelectric Project (909 MW)
Proposal No.	IA/AR/RIV/573804/2026
Location (Including Coordinates)	The Niare HE Project is located in upper reaches of Subansiri River near Orak village. The dam site is located about 4.8 km downstream of the Hari Chu Nallah confluence with Subansiri at Longitude 93^0 31' 13.45" E and Latitude 28^0 21' 33.87" N. The Powerhouse is located at left bank of Subansiri river near Orak village at Longitude 93^0 32' 48.08" E and Latitude 28^0 22' 02.13" N.
Inter- state issue involved	No
Seismic zone	Zone V

- **Category details:**

Category of the project	A
Provisions	Project Activity covered at S.N.1(c)
Capacity / Cultural command area (CCA)	909 MW
Attracts the General Conditions (Yes/No)	No
Additional information (if any)	No

- **Electricity generation capacity:**

Powerhouse Installed Capacity	909 MW
Generation of Electricity Annually	3118.87 MU (Main unit)

	419.55 MU (Auxiliary)
No. of Units	6 (Main PH- 4 units; Auxiliary PH - 2 units)
Additional information (if any)	

- **ToR/EC Details:**

Cost of project	8477.67 Crore
Total area of Project	175.05 Ha (forest land)
Height of Dam from River Bed (EL)	149.50 m
Length of Tunnel/ Channel	4100 m
Details of Submergence area	The submergence area is 48 ha.
Types of Waste and quantity of generation during construction/Operation	Muck from excavation, solid waste from labour colony and construction waste
E-Flows for the Project	E-flow will be released as per applicable guidelines.
Is Projects earlier studies in Cumulative Impact assessment & Carrying Capacity studies (CIA&CC) for River in which project located. If yes, then c) E-flow with TOR /Recommendation by EAC as per CIA&CC study of River Basin. d) If not the E-Flows maintain criteria for sustaining river ecosystem.	Yes As per Cumulative Impact and Carrying Capacity Study (CI&CC) of Subansiri Basin including downstream impacts carried out by CWC in 2015, minimum environmental flow has been considered as 20% of the average flow in monsoon, pre & post monsoon and lean period of 90% dependable year respectively.
No. of trees/saplings proposed in view of 'Ek Ped Maa Ke Naam' campaign	200

- **Muck Management Details:**

No. of proposed disposal area/ (type of land-Forest/Pvt. land)	35 ha (unclassed 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	-
Government land	-
Forest Land	175.05 Ha
Total Land	175.05 Ha
Submergence area/Reservoir area	48 Ha
Additional information (if any)	

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

sForest Land/ Protected Area/ Environmental Sensitivity Zone	**Yes/No**	**Details of Certificate / letter/Remarks**
Reserve Forest/Protected Forest Land	-	No project component falls in any notified protected area. Nearest Protected Nidak Danyi Wildlife Sanctuary is the nearest protected area and is about 70 Km from the project site.
National Park	-	
Wildlife Sanctuary	-	

- **Court case details:** Nil

- **Previous EC compliance and necessary approvals:**

Particulars	**Letter no. and date**
Certified EC compliance report (if applicable)	Not Applicable
Status of Stage- I FC	Forest clearance application submitted on 26/11/2025 vide Proposal No. FP/AR/HYD/IRRIG/559610/2025. Accepted in PSC-I and is pending with DFO for Part-II
Additional detail (If any)	NA
Is FRA (2006) done for FC-I	Yes

- **Miscellaneous**

Particulars	**Details**

Details of consultant	M/s. R S Envirolink Technologies Pvt. Ltd. (RSET) (*NABET* Accredited *Consultant Organization*) Certificate No : NABET/EIA/25-28/RA0415 Validity : August 15, 2028 Contact Person : Mr. Ravinder Bhatia Name of Sector : River Valley and Hydroelectric Projects Category : A MoEF Schedule : I(C) Address : 402, Radisson Suites Commercial Plaza, B Block, Sushant Lok Phase I, Gurugram, Haryana - 122009. E-mail : ravi@rstechnologies.co.in Land Line : (0124) 4295383 Cellular : (+91) 9810136853
Project Benefits	• Project will generate 3538.42 MU annually in a 90% dependable year. • A number of marginal activities and jobs will be available to the locals during the construction phase. • Local Area Development, facilities in Education, medical, transportation, road network and other infrastructure. • An opportunity for small-scale and cottage industries to develop in the area
Status of other statutory clearances	Forest Clearance - Online application seeking forest diversion submitted on 26/11/2025 vide Proposal No. FP/AR/HYD/IRRIG/559610/2025. Alongside, other statutory clearances (as applicable) from State as well as Central government will be obtained post completion of Detailed Project Report.

R&R details	The forest land proposed for diversion has been categorized as Unclassed State Forest. Entire land is also considered as community land, therefore R&R plan will be prepared to compensate for the acquisition of 175.05 ha of land.
Additional detail (If any)	-

53.7.3 The EAC during deliberations noted the following:

- The Expert Appraisal Committee (EAC) deliberated on the information submitted (Form 1, PFR, kml file, etc.) and as presented in the meeting and observed that the proposal is for grant of TOR for conducting EIA/EMP for Niare Hydro Electric Project (909 MW) in an area of 175.05 Ha located at Sub-district Limeking Circle, District Upper Subansiri, Arunachal Pradesh by M/s Andra Power Private Limited .

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

- The EAC noted that the Terms of Reference (ToR) for the project was issued by the MoEF&CC vide letter dated 04.06.2021 for an installed capacity of 870 MW, pursuant to which Survey & Investigation (S&I), DPR preparation, and EIA studies were undertaken by the Project Proponent the capacity has been increased to 909 MW. The Committee further observed that the land requirement has been substantially reduced from 429.585 ha envisaged at the time of earlier ToR to 175.05 ha after finalization of the project layout due to reduction in FRL, resulting in a decrease of about 254.5 ha (approximately 59%). It was also noted that the total land comprises Unclassed State Forest (USF) and private land, and a forest diversion proposal has been submitted vide Proposal No. FP/AR/HYD/IRRIG/559610/2025 dated 26.11.2025 for 175.05 ha. Further, the Committee noted that an amendment in ToR was applied vide Proposal No. IA/AR/RIV/571878/2026 dated 17.03.2026; however, in view of the expiry of the earlier ToR on 03.06.2026, the PP has submitted a fresh ToR application for consideration of the Ministry.

- The EAC noted that CIA& CCS study has been completed for Subansari river basin, wherein the instant proposal has been included and recommended in said CIA&CCS.

53.7.4 The EAC after detailed deliberation on the information submitted and as presented during the meeting **recommended** for grant of Standard ToR for conducting EIA study to the project with Public Consultation for Niare Hydro Electric Project (909 MW) in an area of 175.05 Ha located at Sub-district Limeking Circle, District Upper Subansiri, Arunachal Pradesh by M/s Andra Power Private Limited, under the provisions of EIA Notification, 2006,

as amended along with the following additional/specific ToR. The PP shall be responsible for any objections on adverse impacts on the States downstream.

[A] Environmental Management and Biodiversity Conservation:

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

EIA/EMP report.

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

xvii. Endemic plant and animal species found in the area concerned shall be provided instead listing entire endemic species found in the State.

xviii. Details of Flora and Fauna reported in submergence area, Nos. of tree along with their density and nomenclature of the tree species required to be felled for reservoir creation andother project component.

xix. Project impact on avi-fauna shall be studied and incorporated in EIA/ EMP report.

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

xxi. The EAC will visit the project site before considering the proposal for grant of EC.

[B] Socio-economic Study

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

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

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

iv. Tentative no. of project affected families shall be identified and accordingly appropriate Rehabilitation & Resettlement plan shall be prepared. Details of settlement in 10 km area shall be submitted.

v. Land acquired for the project shall be suitably compensated in accordance with the law of the land with the prevailing guidelines. Private land shall be acquired as per provisions of Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013.

[C] Muck Management

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

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

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

iv. Details of water sprinkling arrangements for arresting the fugitive / dust, emission from transportation and other project activities in project construction area.
v. 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.
vi. Restoration plan for construction area including dumping site of excavated materials by levelling, filling up of burrow pits, landscaping etc.

(D) Disaster Management

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

[E] Miscellaneous

i. Pre-DPR Chapters viz., Hydrology, Layout Map and Power Potential Studies duly appraised by CWC/CEA shall be submitted.
ii. Undertaking need to submitted on affidavit that regarding no activities has been yet started on the project site and water allocated to this scheme shall not be diverted to other purpose.
iii. Both capital and recurring expenditure under EMP shall be submitted.

iv. The 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.

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

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

vii. All the recommendations mentioned in CIA&CSS basin report shall be followed during preparation of EIA/EMP report.

viii. As per Ministry's OM dated 1st August, 2013, PP shall submit application to obtain prior approval of Central Government under the Forest Conservation Act, 1980 for diversion of forest land required for such projects will be submitted as soon as the actual extent of forest land required for the project is known to the project proponent, and in any case, within 6 months of issuance of ToR. However, no proposal will be put up before EAC

without submission of application for forest clearance, wherever applicable.

ix. PP shall provide details of acquisition of land for the proposed project as per OM no. 22-76/2014-IA.III dated 07.10.2014.

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

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ANNEXURE

ATTENDANCE

S. No.	Name of Member	Role	29.04.206	30.04.2026
1.	Prof. Govind Chakrapani	Chairman	P	P
2.	Dr. Uday Kumar R Y	Member	P	P
3.	DR. J. V. Tyagi	Member	P	P
4.	Shri Ajay Kumar Lal	Member	P	P
5.	Shri Balram Kumar	Member Representative of Central Water Commission (CWC)	P	P
6.	Dr. Kartik Sapre	Member	P	P
7.	Shri Rakesh Goyal	Member Representative of Central Electricity Authority (CEA)	P	P
8.	Dr. J.A. Johnson	Representative of Wildlife Institute of India (WII)	P	P
9.	Dr. A. K. Sahoo	Representative of Central Inland Fisheries Research Institute (CIFRI),	A	P
10.	Shri Yogendra Pal Singh	Member Secretary	P	P

APPROVAL OF THE CHAIRMAN

chakrapani govind < chakrapani.govind@gmail.com >
Thu, 07 May 2026 3:17:33 PM +0530

To "Yogendra Pal Singh"<yogendra78@nic.in>
Cc "govind chakrapani"<govind.chakrapani@es.iitr.ac.in>

Approved.
Chakrapani

On Thu, 7 May, 2026, 2:58 pm Yogendra Pal Singh, <yogendra78@nic.in> wrote:

Dear Sir,

The draft MOM of the EAC(RVHEP) meeting held on 29th &30th April, 2026 were circulated to all EAC members. No comments received till date. Accordingly, the draft MOM is attached herewith for your approval Please.

With Regards,

Yogendra Pal Singh
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