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Government of India
Ministry of Environment, Forest and Climate Change
IA Division
(River Valley and Hydroelectric Projects)
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Minutes of 43RD MEETING OF THE EXPERT APPRAISAL COMMITTEE meeting River Valley and Hydroelectric Projects held from 12/11/2025 to 12/11/2025 **Date:** 18/11/2025

MoM ID: EC/MOM/EAC/342984/11/2025

Agenda ID: EC/AGENDA/EAC/342984/11/2025

Meeting Venue: N/A

Meeting Mode: Virtual

Date & Time:

12/11/2025	10:30 AM	02:30 PM

1. Opening remarks

The 43rd 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 through virtual mode, under the Chairmanship of Prof. G. J. Chakrapani.

2. Confirmation of the minutes of previous meeting

The Minutes of the Meeting held on 42nd EAC meeting on 31st October, 2025 were confirmed with correction in Agenda Item No. 42.4 of Bargi Open Pumped Storage Hydro Project (1000 MW) at Village Pindrai Mal. (Sahajpuri), Salaiya Mal.(Barangada), Jamthar, Khapa, Newari and Pondi, Sub- District Narayanganj, District Mandla, Madhya Pradesh by M/s Serentica Renewables India 21 Private Limited - Terms of Reference – reg. [Proposal No. IA/MP/RIV/553405/2025; F. No. J-12011/36/2025-IA.I(R)].

It was noted that the recommendations of the EAC under sub-para 42.4.4 were made for Bargi Open Loop Pumped Storage Hydro-electric Project (1000 MW); however due to typographical error the project name got mentioned as Mudghusri Close Loop Pumped Storage (1000 MW) Project.

The sub point 42.4.4 shall be read as follows:

"....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 Bargi Open Pumped Storage Hydro Project (1000 MW) at Village Pindrai Mal. (Sahajpuri), Salaiya Mal.(Barangada), Jamthar, Khapa, Newari and Pondi, Sub- District Narayanganj, District Mandla, Madhya Pradesh by M/s Serentica Renewables India 21 Private Limited, under the provisions of EIA Notification, 2006, as amended along with the following additional/specific ToR..."

3. Details of proposals considered by the committee

Day 1 -12/11/2025

3.1. Agenda Item No 1:

3.1.1. Details of the proposal

Masinta Pumped Storage Project by **NHPC LIMITED** located at **DEOGARH,ODISHA**			
Proposal For		Fresh ToR	
Proposal No	**File No**	**Submission Date**	**Activity Sub-Activity (Schedule Item)**
IA/OR/RIV/554313/2025	J-12011/40/2025-IA.I(R)	07/11/2025	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 Malshej Ghat Closed Loop Pumped Storage Project (1200 MW) in an area of 310.61 Ha located at Village Khubi and Thitabi Tarf Vaishakhare, Sub District Junnar and Murbad, District Pune and Thane, Maharashtra by M/s THDC India Limited.

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

i. Masinta Pump Storage Project is an Off-stream closed loop pumped storage project and none of the reservoirs are located in any river/perennial stream/perennial nallah. No consumptive use of water has been envisaged for power generation. Both the upper and lower reservoirs with a combined capacity of about 25.3 MCM, have to be filled up once at the beginning of plant operation. Masinta Pump Storage Project has been planned near existing Rengali dam near Deogarh District, Odisha.

ii. The Upper reservoir is proposed near village Gurandikhole & is approachable through village Rangamatia, the last motorable point by travelling approx. 10 km from Kandala on NH-49. The reservoir site is around 5 km from village Rangamatia. The Lower Reservoir for Masinta PSP is proposed near village Masinta, which is located at around 5-7 Km away from Barkote in the right bank of River Brahamani. Masinta Pump Storage Project lies near existing Rengali reservoir located in Brahmani river basin near Deogarh District, Odisha.

iii. **Land requirement**: 403.9 ha (approx.)

Components	Tentative Area in Hectares
Forest Land	376.32
Non-Forest Land*	27.58
TOTAL LAND REQUIREMENT	403.90

The exact quantum of Private / Govt. land required shall be evaluated during survey and investigation and EIA/EMP studies.

iv. **Demographic details in 10 km radius of project area**: About 05 nos. of villages comprising 110 families (tentative) are likely to be affected due to the proposed Project. The socio-economic study aims to assess the overall impacts on various facets of socioeconomic environment due to establishment of the project. The information on various aspects of the affected population viz., demographic details, socio-economic and cultural characteristics, enumeration of personal properties of the affected population, education level and occupational profile etc. shall be collected besides ethnographic assessment of PAFs during the EIA & SIA study.

v. **Water requirement:** Pumped Storage projects do not generate any by-product during electricity generation. Hydroelectric power is generated by non-consumptive use of water.

vi. **Project Cost:** The estimated project cost is Rs. 6036.77 Crore. Total capital cost earmarked towards environmental pollution. control measures is approx. 2% to 3% of the estimated project cost. Detail allocation along with Recurring cost (operation and maintenance) shall be done after preparation of EIA/EMP study.

vii. **Project Benefit**: Setting up of the project shall reduced dependence on fossil fuels and promote Clean Energy generation along with overall economic growth, and enhancing energy security for both the state and the nation as a whole. It shall also generate employment in the rural area, boost local economies such as small markets, shops etc. Total employment as direct & indirect shall be taken up during later stages of development of the Project.

viii. **Environmental Sensitive area**: There are no National Parks, Wildlife Sanctuaries, Biosphere Reserves, Tiger, Wildlife Corridors etc. within IO km distance from the project site.

ix. **MoU/ any other clearance/ permission signed with State government:** GRIDCO, Govt of Odisha issued letter on dated 08.10.2025 in favor of NHPC for applying ToR and preparation of DPR.

x. **Muck Disposal:** Approx. 3.5 Lacs Cum. of Muck shall be disposed of in the designated muck dumping sites. A Muck Disposal Plan shall be prepared as part of Environmental Management Plan.

xi. **Resettlement and rehabilitation:** A comprehensive R&R scheme shall be prepared for project affected families (PAFs) by the District Admin. as part of the land acquisition process under RFCTLARR Act, 2013. Also, community development activities of the Project under other heads (such as CSR scheme) are also expected to be beneficial for the local people residing in and around Project area.

xii. **Alternative Studies:** Developing and assessing various alternative schemes is one of the first activities during the preparation of the DPR. Various alternative studies have been carried out for arriving at the most optimal location & layout of the Project. While carrying out the PFR, three alternative sites have been studied and alternative 2 is found suitable, which will be investigated further during DPR preparation.

xiii. **Details of Solid waste/ Hazardous waste generation/ Muck and its management:** Sewage and solid waste shall be generated from project colonies during construction as well as operational phase. Solid waste generated from temporary and permanent colonies during construction as well as operation phase shall be disposed off as per the Solid Wastes Management Rules (SWM), 2016. Hazardous waste if generated, shall be handled as per Hazardous Waste Management Rules, 2016.

xiv. Status of Litigation Pending against the proposal, if any.: Nil

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

· **Project details:**

Name o	TORAp

· **Category details:**

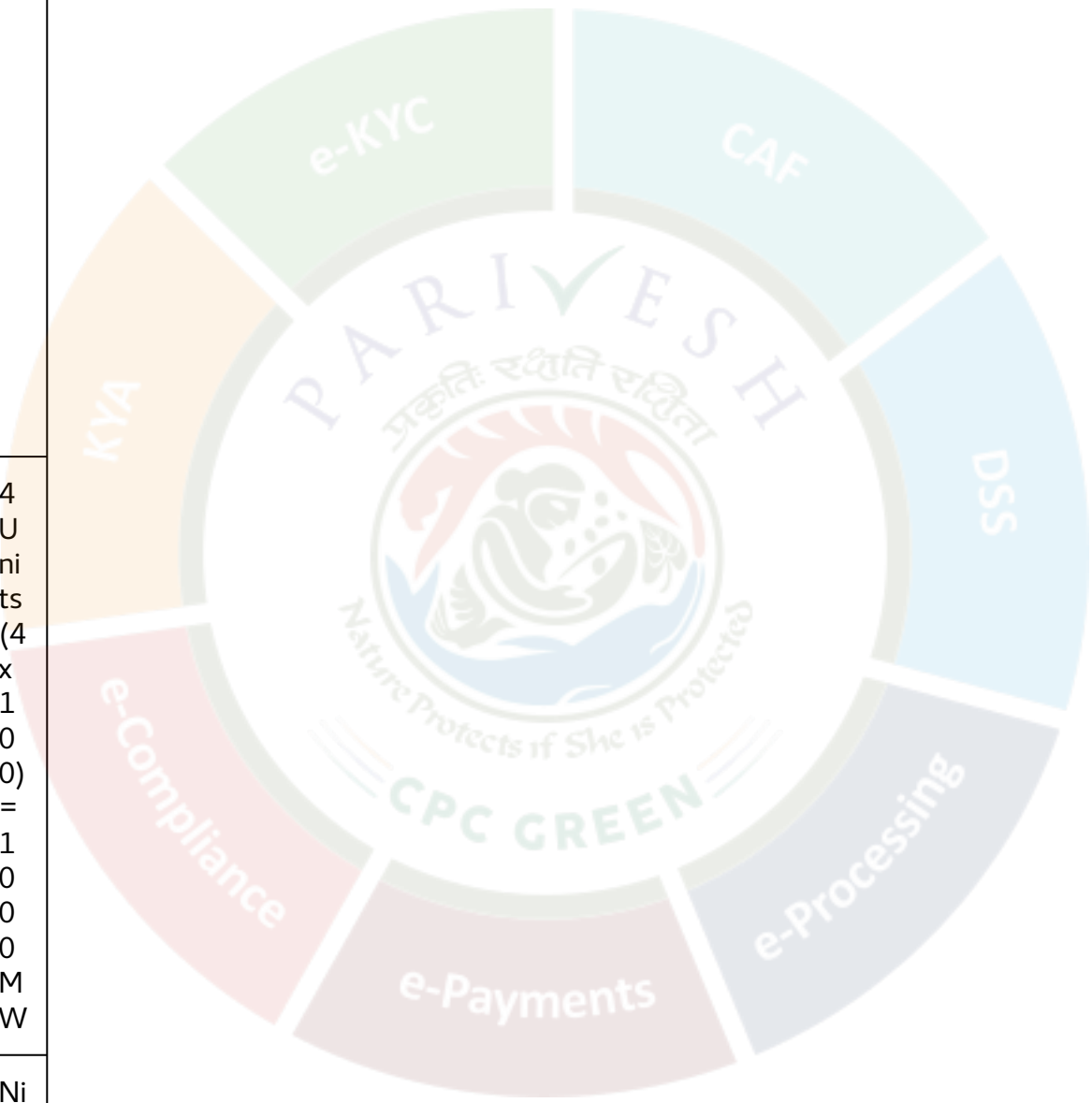
Categ	1(c) Riv

f the Proposal	proval for Masinta of f stream closed loop PSP, Distt Deogarh, Odisha	ory of the project	er Valley/ Irrigation projects Sector: RIV
		Provisions	APumped Storage Project with the objective of p
Location (Including	Tehsil Barkot and Dist		

gcoordinates)	rictDeogarh, Odisha Lat. 21° 37' 13" N, Long. 84° 56' 13" E		owergeneration.
		Capacity/Cultural commandarea (CCA)	10000 MW
Inter-state issue involved	No		
		Attracts the General Co	No

Seismic zone	Zone-III
nditions (Yes/No)	
Additional information (if any)	Nil
Power house Installed Capacity	1000MW

Generation of Electricity Annually	2080.5 MU
No. of Units	4 Units (4 x 100) = 10000 MW
Additional info r	Nil



mation (if any)	
Cost of project	Rs. 6036.77 Crore
Total area of Project	403.9 Ha (Tentative)
Height of Dam from River Bed (EL)	Upper Dam: 54 m Lower Dam: 20

	m
Length of Tunnel/Channel	Pressure shaft 4 nos of 1043 m each
Details of Submergence area	375 Ha (tentative)
Types of Waste and quantity of generation during construction/ Operation	Pumped Storage projects do not generate

	any waste by e-product during electricity generation. Hydroelectric power is generated by non-consum

	ptive use of water. However, during construction phase of the project, about 200 KLD per day of w

	as te w at e r; ap pr ox im at el y 3. 5 la kh cu m of m uc k sh all be di sp os ed of f i n th e de si g na te d m uc k d u m pi n g sit e

	s. A detailed muck disposal plan shall be prepared during EIA study in line of Standard TOR.
E-Flows for the Project	Not applicable on

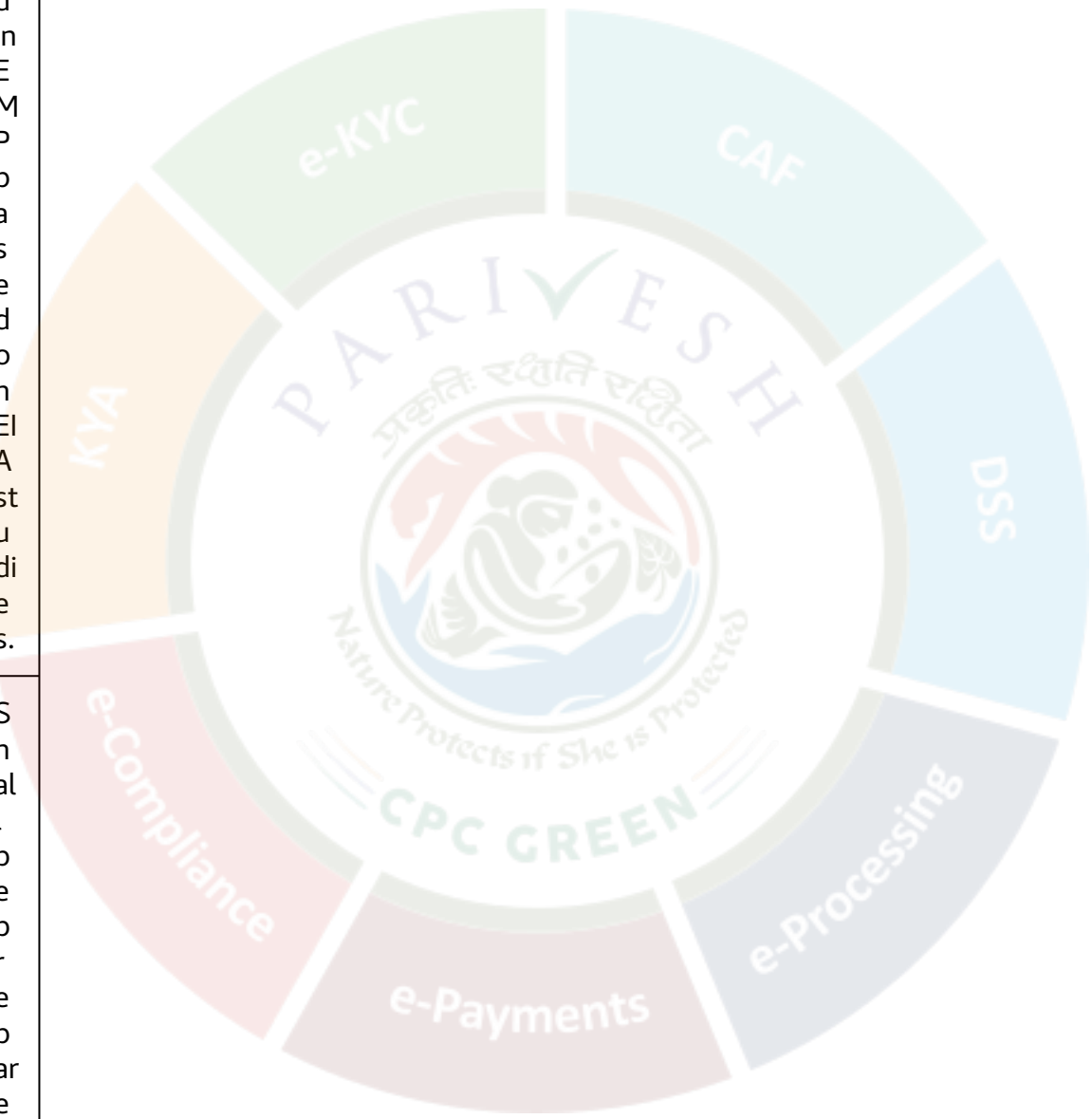
	of f s tr ea m P S P s.
Is Proj ects ea rlier st udies i n Cum ulative Impact assess ment & Carr ying C apacity studies (CIA& CC) fo r River in whic h proje ct loca ted. If yes, th en a) E-fl ow wit h TO R / Re co m me nd ati on by EA C as pe r C I	N ot ap pli ca bl e. **M as in ta P S P is of f st re a m cl os e d lo o p P S P.** N ot ap pli ca bl e. N ot ap pli

A&CC study of River Basin. b) If not the E-Flows maintain criteria for sustaining river ecosystem.	cable.
No. of proposed disposal area/(type	Around 10 ha of area aw

of land-Forest/ Pvt. land)	ill be required for muck dumping. The exact number and area shall be decided

	dedduringsurveyandinvestigationandwillbeincorporatedinEIAstudies.
Muc	Sh

k Management Plan	all be prepared in EMP based on EIA studies.
Monitoring mechanism for Muck Disposal	Shall be prepared in EMP based



	on EIA studies
Private land/ Non Forest Land	27.58 (Tentative)
Government land or Forest	376.3 Ha (Tentative)

Land	
Submergence area/ Reservoir area	375 ha (Tentative)
Total Land	403.9 Ha
Additional information	The quantity of Fore

ion (if any)	st Land & Non Forest Lands shall be finally firmed up at the time of actual survey and d

	EIA/EMP studies.

Forest Land/ Protected Area/ Environmental Sensitivity Zone	**Yes/ No**	**Details of Certificate/ Letter/ Remarks**
Res	Ye	No

erve Forest/ Protected Forest Land	s Reserved as well as unclassified Forest is involved.	Protected area/ ESZ falls within the 10 Km radius of project component including the res
National Park	No	
Wildlife Sa	No	

nctuary		ervoir

· **Court case details:** Nil

· **Miscellaneous**

Particulars	**Details**
Details of consultant	Hiring of consultant is under process.
Project Benefits	Clean and green power generation of 2080 million units a

	nnually. Benefit Under R&R plan; Reduced dependence on Fossil Fuels; Clean Energy Generation; Economic Development; Sustaina

	ble Development, promoting economic growth, and enhancing energy security for both the state and the nation as a whole.
Status	In the p

of other statutory clearance	rocess of applying to concerned Directorate / Department of GOI/ GoAP
R&R details (Tentative)	No. of Villages: 05 Nos. of PAFs: 110 (Tentative) R&R Pla

	n: Shall be firmed up during SIA study.
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

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 Masinta Closed Loop Pumped Storage Project (1000 MW) in an area of 403.9 Ha located at Village Kadapada, Kantapali, Kulsra, etc, Sub District Barkot, District Deogarh, Odisha by M/s NHPC 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.
- During the deliberations the committee noted that the upper reservoir is off-stream and lower reservoir is on small stream (non-perennial). Since lower reservoir is situated on small natural nallah/stream, the committee opined that the project shall be categorized as an open-loop project rather than a closed-loop PSP. Further, during the meeting, the PP informed that the water received from the catchment would be released downstream into the river. The EAC was of the view that the non-perennial small streams/nallahs play an important role in ecosystem stability through supporting unique, adapted communities and provide critical habitat, especially during dry periods. They are hotspots for biodiversity and vital for maintaining ecosystem services. Accordingly, the EAC advised to prepare suitable action plan for sustenance of the natural nallahs/streams after having detailed

analysis of catchment yield and requirement of water for maintaining ecosystem services.

· The EAC noted that the total land requirement for the project is around 403.90 ha, out of which 27.58 ha is non-forest land and 376.32 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. The EAC noted that the forest area falling within and around the project site comprises a very dense canopy, indicating a mature and ecologically sensitive forest ecosystem. Such dense canopy cover suggests the presence of significant biodiversity, including large trees, undergrowth, and potential habitats for wildlife species. The Committee emphasised the need for detailed survey of the study area to collect appropriate data on wild flora and fauna so that impact prediction can be done accurately considering the aspects like fragmentation of habitat, and disruption of ecological functions etc. Further, there are no National Park, Wildlife Sanctuary, Biosphere Reserve, Tiger, Wildlife Corridor etc. within 10 km distance from the project site.

· The water requirement will be met from the existing Rengali Reservoir, which is located about 12 km from the upper reservoir 17.55 MCM for initial filling and 4.70 MCM for annual recoupment. The EAC observed that the evaporation loss calculations appear to be significantly high and need to be re-examined by the PP. In case such high annual water requirement is confirmed, the PP may explore suitable technologies to mitigate evaporation losses, such as installation of floating solar panels on the upper and lower reservoirs.

· While discussing the alternatives studied by the PP, the EAC observed that only a limited number of environmental concerns were considered while finalizing the site. The Committee also noted that site clearance approval has been obtained by the PP from CWC/CEA. Therefore, the PP shall prepare stringent measures to preserve the environment and ecology of the area.

3.1.5. Recommendation of EAC

Recommended

3.1.6. Details of Terms of Reference

3.1.6.1. Specific

Miscellaneous:	
1.	Both capital and recurring expenditure under EMP shall be submitted
2.	Pre-DPR Chapters viz., 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.
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.	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.
2.	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.
3.	The inter-state issues (if applicable) of Rengali reservoir located in Brahmani river basin near Deogarh District, Odisha shall also be examined by the CWC.
4.	The PP will submit a 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 376.32 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.
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 (CO2, CH4 etc.) emissions during construction and during operation till the life of the project shall be estimated and submitted.
12.	The longitudinal connectivity/Free flowing sketch be provided in the EIA/EMP report.
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.	In case any other project is present on the river, Cumulative Impact of projects in the basin on carrying capacity and sustainability of Reservoir/ River /nala of catchment area due to tapping of water for filling reservoir shall be studied.
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 three seasons.
18.	A study shall be carried out on impact of project activity on the aquatic and terrestrial ecosystem, within project area classifying the impact zones (highly impact/low impact zone) based on seasonal variations and covering the aspects related to impacts on aquatic ecosystem/ primary productivity due to quantity of water to be lifted for power generation and thermal stratification. Accordingly, Environment Management plan shall be prepared.
19.	Reservoir/ River banks protection plan all along the submergence need to be prepared and incorporated in EIA/ EMP.
20.	Scope of watershed development in the 10 km radius of the project shall be studied in consultation with Indian Council of Agriculture Research (ICAR) Institutes/ Expert Govt. institutions and accordingly a detailed Water Shed Development Plan shall be prepared and incorporated in EIA/ EMP report.
21.	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.

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.
54.	Collection of primary data on agricultural activity, crop and their productivity and irrigation facilities components.
55.	For categorization of sub-catchment into various erosion classes and for the consequent CAT plan, the entire catchment (Indian Portion) is to be considered and not only the directly the draining catchment.
56.	Documentation of aquatic fauna like macro-invertebrates, zooplankton, phytoplantktons, benthos etc.
57.	Fish and fisheries, their migration and breeding grounds.

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

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

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

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

	The plan will also incorporate community development strategies.
14.	Public Health Delivery Plan including the provisions of drinking water supply for local population shall be in the EIA/EMP Report. Status of the existing medical facilities in the project area shall be discussed. Possibilities of strengthening of existing medical facilities, construction of new medical infrastructure etc. will be explored after assessing the need of the labour force and local populace.
15.	Local Area Development Plan to be formulated in consultation with the Revenue Officials and Village Pancahayats. Appropriate schemes shall be prepared under EMP for the Local Area Development Plan with sufficient financial provisions.
16.	Labour Management Plan for their Health and Safety.
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 Mukesh Sharma	Member (EAC)	muk***@iitk.ac.in	
3	Dr Uday Kumar R Y	Member (EAC)	uda********@yahoo.com	
4	Dr J A Johnson	Member (EAC)	jaj@wii.gov.in	Absent
5	Dr J V Tyagi	Member (EAC)	jvt******@gmail.com	
6	Shri Kartik Sapre	Member (EAC)	kar********@gmail.com	Absent
7	Shri Ajay Kumar Lal	Member (EAC)	akl****@gmail.com	
8	Dr A K Sahoo	Member (EAC)	ami***@gmail.com	

9	Shri Rakesh Goyal	Member	goy*********@nic.in	
10	Shri Balram Kumar	Member	emo***@nic.in	
11	Yogendra Pal Singh	Scientist - F	yog*******@nic.in	

MINUTES OF THE 43RD MEETING OF THE EXPERT APPRAISAL COMMITTEE FOR RIVER VALLEY AND HYDROELECTRIC PROJECTS HELD ON 12TH NOVEMBER, 2025 THROUGH VIDEO CONFERENCE

The 43rd 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 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 42nd EAC meeting:

The Minutes of the Meeting held on 42nd EAC meeting on 31st October, 2025 were confirmed with correction in Agenda Item No. 42.4 of Bargi Open Pumped Storage Hydro Project (1000 MW) at Village Pindrai Mal. (Sahajpuri), Salaiya Mal.(Barangada), Jamthar, Khapa, Newari and Pondi, Sub- District Narayanganj, District Mandla, Madhya Pradesh by M/s Serentica Renewables India 21 Private Limited - Terms of Reference – reg. [Proposal No. IA/MP/RIV/553405/2025; F. No. J-12011/36/2025-IA.I(R)].

It was noted that the recommendations of the EAC under sub-para 42.4.4 were made for Bargi Open Loop Pumped Storage Hydro-electric Project (1000 MW); however due to typographical error the project name got mentioned as Mudghusri Close Loop Pumped Storage (1000 MW) Project.

The sub point 42.4.4 shall be read as follows:

"….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 Bargi Open Pumped Storage Hydro Project (1000 MW) at Village Pindrai Mal. (Sahajpuri), Salaiya Mal.(Barangada), Jamthar, Khapa, Newari and Pondi, Sub- District Narayanganj, District Mandla, Madhya Pradesh by M/s Serentica Renewables India 21 Private Limited, under the provisions of EIA Notification, 2006, as amended along with the following additional/specific ToR…"

<u>Agenda Item No. 43.1</u>

Malshej Ghat Closed Loop Pumped Storage Project (1200 MW) in an area of 310.61 Ha located at Village Khubi and Thitabi Tarf Vaishakhare, Sub District Junnar and Murbad, District Pune and Thane, Maharashtra by M/s THDC India Limited - Terms of References (TOR) – reg.

[Proposal No. IA/MH/RIV/557016/2025; F. No. J-12011/39/2025-IA.I(R)]

43.1.1 The proposal is for grant of Terms of Reference (TOR) to the project Malshej Ghat Closed Loop Pumped Storage Project (1200 MW) in an area of 310.61 Ha located at Village Khubi and Thitabi Tarf Vaishakhare, Sub District Junnar and Murbad, District Pune and Thane, Maharashtra by M/s THDC India Limited.

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

i. Malshej Ghat PSP is proposed to generate 1200 MW of peak power during peak hours by drawing water from the Upper reservoir into a powerhouse by utilizing rated net heads of 418.36 m and 441.84 m between the Upper and Lower reservoir during generation and pumping mode within off-peak periods where demand is less under which water is planned to pump up to the Upper reservoir in pumping mode. The annually generation of full cycle 2505.2 MU of energy considering 95% machine availability. The pumping energy requirement would be annually of full cycle 3193.6 MU considering 95% machine availability which gives a cycle efficiency of 78.4 %.

ii. The proposed upper reservoir is located at Khubi village in Murbad Taluka of Pune district, with geographical coordinates of latitude 19°20'58.73" N and longitude 73°48'01.44" E. The proposed lower reservoir is situated near Thitabi village in Murbad Tehsil of Thane district, at latitude 19°20'49.04" N and longitude 73°45'45.12" E.

iii. The upper and the lower reservoirs proposed for the Malshej Ghat PSP are to be constructed artificially to accommodate live storage of 8.43 MCM and 7.01 MCM respectively. Malshej PSP (1200 MW) will require 13 MCM for initial reservoir filling and thereafter 1.2 MCM per year will be required on annual basis from Kalu river for restoring the storage capacity lost due to evaporation.

iv. The proposed project envisages following major civil structures:

- An upper reservoir created by construction of 28 m – 31 m high CFRD with a gross storage capacityof 11.79 MCM.
- A lower reservoir created by construction of 6 m – 52 m high CFRD with a gross storage capacity of 7.79 MCM.
- 2 nos. of Intake/Outlet structure proposed at the upper reservoir comprising of a self-cleaning vertical trash rack for each intake to avoid entry of debris in the conduit, the same structure also acts as an outlet structure to discharge water into the upper reservoir during pumping.
- 2 nos. of circular steel lined Pressure shafts of 6.0 m diameter with avg. 1465.10 m long, of which each one PS will be bifurcating into two numbers of 4.15 m diameter unit pressure shaft to feed 4 units of 300 MW capacity.
- Underground Powerhouse Complex comprising of main powerhouse cavern 153 m (L) x 24 m (W) x 54.5 m (H) housing all the 4 units with service bay & control block,

transformer cum GIS cavern and downstream surge chamber. The powerhouse complex is proposed to be accessed by various construction and permanent adits

- A Pothead yard of size 100 m (L) x 50 m (W).
- 4 nos. of 4.6 m diameter unit TRTs & 2 nos. of 6.5 m diameter main TRT, each having an avg. length of 2050.6 m has been proposed to discharge water from the downstream surge gallery.
- 2 nos. of inlet/ outlet structure at the lower reservoir which discharges the water from the main tailrace tunnel in the reservoir, the same acts as an inlet during pumping to draw water from the lower reservoir. The structure comprises of a self-cleaning vertical track rack to avoid entry of debris into the conduit.

v. **Land requirement:**

Forest Land	:	74.06 ha
Non-forest Land	:	236.55 ha
Total Land	:	310.61 ha

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

- Villages within the study area are small, scattered, and primarily agrarian. Population density is low compared to state averages.
- Habitation in the area is mainly comprised of Schedule Tribe population represented by Thakur and Mahadev Koli. Local communities follow traditional customs and festivals, with strong dependency on natural resources.
- Subsistence farming, horticulture, livestock rearing, and wage labour are the main sources of income. Bamboo and cane-based handicrafts are also practiced.
- Basic infrastructure such as schools, health facilities, and road networks exists but remains underdeveloped.

Parameters	Khubi	Khireshwar	Karanjale	Diwanpada	Sawarne	Thitabi Tarf Baishakhare
Households	136	190	198	55	99	44
Total Population	630	972	925	298	551	210
Male Population	305	495	473	152	276	96
Female Population	325	477	452	146	265	114
Scheduled Caste (SC) Pop.	56	24	56	0	0	0
Scheduled Tribe (ST) Pop.	395	927	513	283	492	210

(Source: Census 2011; Mission Antyodaya 2020)

- The demographic profile of the villages surrounding the project area indicates **Khireshwar** has the highest total population (**972**) with **190** households.
- **Thitabi Tarf Baishakhare** is the smallest with a population of **210** with **44** households.
- All locations show a near-even split between male and female populations, with males slightly outnumbering females overall.
- Scheduled Tribe (ST) populations make up a substantial majority in most areas represented by Thakur and Mahadev Koli community.
- Diwanpada, Sawarne, and Thitabi Tarf Baishakhare report **zero** Scheduled Caste (SC) residents.

vii. **Water requirement:** Malshej Ghat Closed Loop Off Stream Pumped Storage Project will require 13.0 MCM for one time filling and thereafter ~ 1.2 MCM per year will be required on annual basis for restoring the storage capacity lost due to evaporation.

viii. **Project Cost**: The estimated project cost is Rs 6815.03 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).

ix. **Project Benefit**: Total Employment will be 1200 nos. during construction & 50 nos. during O&M persons as direct & indirect.

x. **Environmental Sensitive area:** Kalsubai Harishchandragad WLS is about 3.0 km from project area. Project is located outside the notified ESZ boundary (MoEF&CC, S.O. 1367 (E) dated 28.04.2017); therefore, Wildlife clearance is not applicable. River/ water body, Water will be pumped from Kalu River.

xi. The MOU was signed on September 03, 2024, between WRD, Government of Maharashtra and M/s THDC India Limited.

xii. **Alternative Studies:**

Earlier (2010) Proposal

- Malshej Ghat PSP was studied by JV consortium of EDF, France & Tata Consulting Engineers Limited, India in 2010.
- This scheme envisaged a pumped storage project with an installed capacity of 700 MW.
- The scheme proposed weekly regulations to meet the peak demand of about 8 hours of peak power on weekdays. Off peak pumping hours are considered as 7 hours on weekdays and balance pumping on Sundays is required for weekly regulation.
- Upper reservoir was proposed along Pimpalgaon Joge irrigation project reservoir and lower reservoir across Kalu river.
- The scheme was ruled out by THDC as the project falls in ESZ of Kalsubhai

Harishchandragad WLS

- Further, four other alternative schemes were prepared.

The site selection process is based on following approaches:

- Utilization of available head at project site to the maximum extent feasible
- Development of economical and optimized layout
- Ease of construction
- Minimal area of land acquisition to accommodate various project components
- Avoid / minimize submergence of forest land
- Avoid interference with existing / allotted schemes
- Avoid location of project within Eco Sensitive Zones (ESZ) of existing Wildlife Sanctuaries

Alternative1 (340 MW)	• Upper reservoir on the plateau with general bed level is about EL. 698 - 700 m. • Lower reservoir is on similar lines as proposed in the 2010 DPR, keeping it outside of ESZ of Kalsubai Harishchandragad Wildlife Sanctuary • Underground Powerhouse
Alternative2 (1000 MW)	• Upper reservoir at same location as Alternative 1 • Lower reservoir located on the left bank of the River Kalu • Underground Powerhouse
Alternative 3A & 3B (1000 MW+1000 MW)	• Upper reservoir location at same location as Alternative 1and 2 on flat plateau • Lower reservoir left bank of river Kalu and 1.6 Km d/s of Alternative 2 lower reservoir • Underground Powerhouse
Alternative 4 (1000 MW)	• A new upper reservoir (as compared to the earlier 2010 DPR) • Lower reservoir as of Alternative 3B • Underground powerhouse
Alternative 5 (2400 MW)	• Earlier proposal of the Malshej Ghat PSP albeit with an artificial pond as upper reservoir • Same lower reservoir as of 2010 DPR • Underground powerhouse

Comparison of Alternatives

Particulars	Alt 1	Alt2	Alt3	Alt4	Alt5
Upper Reservoir					
Bed Level	EL. 675.0 m	EL. 675.0 m	EL. 675.0 m	EL. 800.0 m	EL. 675.0 m
FRL	EL. 693.0 m	EL. 693.0 m	EL. 700.0 m	EL. 825.0 m	EL. 700.0 m
MDDL	EL. 681.0 m	EL. 681.0 m	EL. 681.0 m	EL. 802.0 m	EL. 680.0 m

Live Storage	7.18 MCM	7.18 MCM	12.19 MCM		4.60 MCM	18.98 MCM
Lower Reservoir			**3A**	**3B**		
Bed Level	EL. 220.0 m	EL. 260.0 m	EL. 260.0 m	EL. 240.0 m	EL. 240.0 m	EL. 235.0 m
FRL	EL. 245.0 m	EL. 290.0 m	EL. 290.0 m	EL. 273.0 m	EL. 273.0 m	EL. 289.0 m
MDDL	EL. 225.0 m	EL. 264.0 m	EL. 264.0 m	EL. 242.0 m	EL. 242.0 m	EL. 266.0 m
Live Storage	1.93 MCM	6.45 MCM	6.45 MCM	5.69 MCM	5.69 MCM	15.38 MCM
Pressure Shaft	4.6 m dia; 2974 m (L)	6 m dia; 1436 m (L)	6 m dia; 1436 m (L)	5.6 m dia; 3107.5 m (L)	5.2 m dia; 2974 m (L)	6.5 m dia; 670.8 m (L)
Tail Race Tunnel	5.6 m dia; 976.4 m (L)	7.5 m dia; 827.8 m (L)	7.5 m dia; 827.8 m (L)	7.5 m dia; 723 m (L)	6.2 m dia; 68.5 m (L)	8.0 m dia; 1400.0 m (L)
Powerhouse	UG	UG	UG	UG	Surface/ Pit	UG
Rated Head	447.0 m	405.0 m	406.0 m	430.5 m	550.0 m	403.0 m
Generating Hours	6 hours	6 hours	6 hours	6 hours	6 hours	6 hours
Design Discharge	90 cumec	299 cumec	299 cumec	264 cumec	213 cumec	712 cumec
Installed Capacity	340 MW	1000 MW	1000 MW	1000 MW	1000 MW	2400 MW

Shortlisting of Alternatives

- The Alternative 1 with its lower reservoir on River Kalu can generate only 340 MW due to the constraints of ESZ of Kalsubai Harishchandragad Wildlife Sanctuary, therefore rejected
- The Alternative 5 has the advantage of utilizing the large upper plateau for establishing the upper reservoir while a convention dam is proposed on River Kalu for establishing the lower reservoir to generate 2400 MW, due to components falling in ESZ of Kalsubhai Harishchandragad WLS, rejected.
- Alternative 2 has not been considered since it is both topographically and seismically difficult.
- Alternate 4 was not considered due to Upper reservoir topographically unsuitable as the amount of cutting is large for the same installed capacity. Also the Upper reservoir is in completely new area.
- Alternative 3 (with LR 3A), though have shorter water conductor system, is rejected because:
- Construction of the lower reservoir of this alternative requires the diversion of two Nallahs which is technically feasible but will require careful planning so that it will remain successful throughout the service life of the project.
- There is a dargah/mazar erected in the reservoir area which needs to be relocated which may result in a social issue at the project site.

- Tithabi Forest Resort operated by the Forest Dept. of Thane is about 60 m from the lower reservoir.

Alternative 3 (with LR 3B) is selected with enhanced installed capacity of 1200 MW as it involves only 74 Ha of forest land, well outside the ESZ and technically most suitable among all the alternatives studied.

WCS Optimization for Alternative 3 (with LR 3B)

Three different options of water conductor systems were generated and studied:

Option 1 – **Deep seated Underground Powerhouse**

The MAT to the underground PH is about 1350 m; various other adits are 1175 m to the surge chamber and CAT is about 1300 m due to the powerhouse being so deep seated in the hill. An adit of 1350 m length is required for the construction of the tail race tunnels. Longer construction time and more muck generation.

Option 2 - Single VPS

Similar to option 1, however the underground powerhouse has been moved closer to the foothill thereby reducing the length of the access adits.

Although the length of the access adits was reduced in this option, the length of the bottom horizontal pressure shaft has increased to about 1097 m.

Height of vertical penstock is also about 425m, which is very challenging and time consuming for construction point of view.

This bottom horizontal pressure shaft is also segment where the maximum pressure will be encountered both internally and externally, thereby having higher steel liner thickness.

Option 3 – **Twin limb VPS (selected)**

As in Option 2, the underground PH at the base on the foothill.
However, the elevation difference from the upper reservoir to the underground PH is split into two separate vertical pressure shafts interconnected with intermediate horizontal pressure shaft of about 760 m.

The total height of the VPS is reduced to 336 m as compared to higher heights in option 1 & 2

Reduction in the high-pressure section of the bottom horizontal pressure shaft section in comparison to the earlier options.

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

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

- **Project details:**

Name of the Proposal	Malshej Ghat Closed Loop off stream Pumped Storage Project
Location (Including coordinates)	Upper Reservoir : Latitude: 19°20'58.73" N Longitude: 73°48'1.44" E Lower Reservoir : Latitude: 19°20'49.04" N Longitude: 73° 45' 45.12" E
Inter- state issue involved	No
Seismic zone	Zone-III

- **Category details:**

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

- **Electricity generation capacity:**

Powerhouse Installed Capacity	1200 MW
Generation of Electricity Annually	2505.2 MU
No. of Units	4 nos. (4 x 300 MW)
Additional information (if any)	Nil

- **ToR/EC Details:**

Cost of project	6815.03 Cr.
Total area of Project	310.61 ha
Height of Dam from Riverbed (EL)	Lower Dam – 52.0 m Upper Dam –31.0 m
Length of Tunnel/Channel	12100 m
Details of Submergence area	132.70 ha

Types of Waste and quantity of generation during construction/ Operation	Muck from excavation, solid waste from labour colony and construction waste
E-Flows for the Project	Not Applicable, as this is Closed Loop Pumped Storage Project (PSP)
Is Projects earlier studies in Cumulative Impact assessment & Carrying Capacity studies (CIA&CC) for River in which project located. If yes, then a) E-flow with TOR /Recommendation by 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)	50 ha (Non-Forest Land)
Muck Management Plan	Will be Provided in EIA/EMP report
Monitoring Mechanism for Muck Disposal	Will be Provided in EIA/EMP report

- **Land Area Breakup:**

Private Land Government land	236.55 ha (Non Forest Land)
Forest Land	74.06 ha
Total Land	310.61 ha
Submergence area/Reservoir area	132.70 ha
Additional information (if any)	Nil

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

Forest Land/	**Yes/No**	**Detailsof Certificate / letter/**

Protected Area/ Environmental Sensitivity Zone		**Remarks**
Reserve Forest/Protected Forest Land	-	• Kalsubai Harishchandragad WLS is about 3.0 km from project area. Project is located outside the notified ESZ boundary; (MoEF&CC, S.O. 1367 (E) dated 28.04.2017); therefore, Wildlife clearance is not applicable.
National Park	-	
Wildlife Sanctuary	-	

- **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	• Pumped storage hydropower is a modified use of conventional hydropower

	technology to store and manage energy or electricity by moving water between an upper and lower reservoir. Currently, pumped storage round-trip or cycle energy efficiencies exceed 75%, comparing favorably to other energy storage technologies and thermal technologies. This effectively shifts, stores, and reuses energy generated until there is corresponding demand for system reserves and variable energy integration. This shifting can also occur to avoid transmission congestion periods, to help more efficiently manage transmission grid, and to avoid potential interruptions to energy supply. This is important because many of the renewable energy resources being developed (e.g., wind and solar) are generated at times of low demand and off-peak energy demand periods are still being met with fossil fuel resources, often at inefficient performance levels that increase the release of greenhouse gas emissions. • Further, pumped storage projects are critical to the national economy and overall energy reliability because it's: o Least expensive source of electricity, not requiring fossil fuel for generation o An emission-free renewable source o Balancing grid for demand driven variations o Balancing generation driven variations o Voltage support and grid stability Apart from this, proposed PSP will also benefit the local community by creating employment opportunities and will result in upliftment of livelihood and socio-economic conditions.
Status of other statutory clearances	Forest Clearance - Online application seeking forest diversion for around 74.06 Ha after receipt of ToR Approval. Alongside, other statutory clearances (as applicable) from State as well as Central

	government will be obtained post completion of Detailed Project Report.
R&R details	Details shall be evaluated during EIA/EMP Studies
Additional detail (If any)	Nil

43.1.3 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 Malshej Ghat Closed Loop Pumped Storage Project (1200 MW) in an area of 310.61 Ha located at Village Khubi and Thitabi Tarf Vaishakhare, Sub District Junnar and Murbad, District Pune and Thane, 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 Malshej Ghat PSP is proposed to generate 1200 MW comprises of Upper and Lower reservoir located away from riverine system and therefore it is treated as a close loop PSP. Malshej PSP (1200 MW) will require 13 MCM for initial reservoir filling and thereafter 1.2 MCM per year will be required on annual basis from Kalu river for restoring the storage capacity lost due to evaporation.

- The EAC observed that the small rivulets feeding water into the Kalu River may get affected due to the proposed project. Therefore, the Committee advised the PP to ensure that no such rivulets are disturbed or impacted during project establishment. Further, it was noted that a few PSPs are already proposed in the region drawing water from the Kalu River. Hence, it is essential that the PP obtain necessary hydrological clearances/approvals from the Central Water Commission (CWC) and the State Government prior to submission of the proposal for Environmental Clearance.

- The EAC noted that the total land required for the construction of various components and related works for Malshej Ghat PSP is estimated to be around 310.61 ha, out of which 236.55 ha is non-forest land and 74.06 ha is forest land. Diversion of forest land for non-forest purpose will be involved for construction of Malshej Ghat 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 EAC further noted that the project is located around 3 km from Kalsubai Harishchandragad

Wildlife Sanctuary. The proposed project is located outside the ESZ (notified) of Kalsubai Harishchandragad wild life sanctuary.

- It was observed that there is large difference in rain fall data of Integrated State Water Plan for West Flowing River Basins in Maharashtra (ISWP) and data sourced from Indian Meteorological Department (IMD). The Committee suggested to get hydrology assessment one by the CWC.

- It was observed by the EAC that all the components of Malshej Ghat PSP are located within the proposed Western Ghats ESA, Maharashtra as per MOEF&CC draft notification no. S.O.30609(E) dated July 31, 2024.

- It has been observed that a Memorandum of Understanding (MoU) was signed between Department of Water Resources, Government of Maharashtra and M/s THDC India Limited on 03.09.2024, for the development of a 700 MW capacity project. However, the PP has submitted the proposal for a 1200 MW capacity project. Therefore, the Committee suggested that the PP may get the MoU amended accordingly to reflect the revised project capacity of 1200 MW.

43.1.4 The EAC based on the information submitted and as presented during the meeting, recommended the proposal for grant of Specific ToR issued by the Ministry for Close Loop Pumped Storage Projects vide OM dated 14.08.2023 for conducting EIA study for proposed construction of the project for Malshej Ghat Closed Loop Pumped Storage Project (1200 MW) in an area of 310.61 Ha located at Village Khubi and Thitabi Tarf Vaishakhare, Sub District Junnar and Murbad, District Pune and Thane, 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 in MoU in terms of the revised capacity from 700 MW to 1200 MW.

ii. A detailed action plan need to prepare ensuring that no natural rivulets, drainage channels, or streams feeding the Kalu River are disturbed, diverted, or obstructed due to the construction or operation of the project. A detailed study on surface hydrology shall be carried out to assess and demonstrate that the natural drainage pattern of the area remains unaffected.

iii. PP shall submit the Water Utilization Mapping within a 10 km radius of the project for examining the impacts on sustainability of ecosystem of the region after withdrawal of water for proposed project. The risk analysis w.r.t water availability shall also be carried out.

iv. 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.

v. Explore the possibilities for reducing the Forest land requirement. The application for obtaining Stage I FC for 74.06 ha of forest land involved in the project shall be submitted within stipulated time.

vi. A detailed assessment shall be carried out to optimize and possibly reduce the land area earmarked for quarrying area.

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

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. The PP shall prepare a detailed Wildlife Conservation Plan in consultation with the State Forest Department for all Schedule–I species reported or likely to be present in the project area, including the influence zone. The plan shall be duly approved by the Chief Wildlife Warden of the State prior to appraisal of the proposal for Environmental Clearance in view project location around 3 km from the Kalsubai Harishchandragad Wildlife Sanctuary which is located within the Western Ghats Eco Sensitive Area.

x. PP shall submit the detailed plan for filling the reservoir along with necessary approval form water resource department.

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

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. Risk Assessment Study of aquatic biota through its mapping in all streams and nullahs in the study area during rainy season shall be submitted in the EIA/EMP report.

xiv. Detailed study on human-animal conflict during project construction and operation shall be conducted considering past incidences and proper action plan for its management shall be prepared in consultation with State Wildlife Department.

xv. 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.

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

xvii. 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.

xviii. 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.

xix. 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.

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

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

xxii. 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.

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

xxiv. 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. All springs available in the study area

shall be mapped and action plan for their conservation and protection need to be prepared.

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

xxvi. 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.

xxvii. A Sub-committee comprising members from EAC shall visit the site before considering the proposal for EC in view of the location of project located 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. PP shall submit the credible documents to show the status of land acquisition w.r.t project site from/through the concerned State Government as required under Ministry's OM dated 7th October, 2014 for the project land to be acquired.

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

[C] Muck Management:

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

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

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

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

[D] Disaster Management:

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

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

[E] Miscellaneous:

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

ii. Pre-DPR Chapters viz., 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. Undertaking need to be submitted on affidavit stating that no activities has been started on the project site.

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

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

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

ix. The conditions mentioned in the Western Ghats notification (draft notification no. S.O.3060(E) dated 31.07.2024) for development of hydro-power projects issued by the MOEF&CC shall be complied with while preparing EIA/EMP report.

Agenda Item No. 43.2

Masinta Closed Loop Pumped Storage Project (1000 MW) in an area of 403.9 Ha located at Village Kadapada, Kantapali, Kulsra, etc, Sub District Barkot, District Deogarh, Odisha by M/s NHPC Limited - Terms of References (TOR) – reg.
[Proposal No. IA/OR/RIV/554313/2025; F. No. J-12011/40/2025-IA.I(R)]

43.2.1 The proposal is for grant of Terms of Reference (TOR) to the project Malshej Ghat Closed Loop Pumped Storage Project (1200 MW) in an area of 310.61 Ha located at Village Khubi and Thitabi Tarf Vaishakhare, Sub District Junnar and Murbad, District Pune and Thane, Maharashtra by M/s THDC India Limited.

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

i. Masinta Pump Storage Project is an Off-stream closed loop pumped storage project and none of the reservoirs are located in any river/perennial stream/perennial nallah. No consumptive use of water has been envisaged for power generation. Both the upper and lower reservoirs with a combined capacity of about 25.3 MCM, have to be filled up once at the beginning of plant operation. Masinta Pump Storage Project has been planned near existing Rengali dam near Deogarh District, Odisha.

ii. The Upper reservoir is proposed near village Gurandikhole & is approachable through village Rangamatia, the last motorable point by travelling approx. 10 km from Kandala on NH-49. The reservoir site is around 5 km from village Rangamatia. The Lower Reservoir for Masinta PSP is proposed near village Masinta, which is located at around 5-7 Km away from Barkote in the right bank of River Brahamani. Masinta Pump Storage Project lies near existing Rengali reservoir located in Brahmani river basin near Deogarh District, Odisha.

iii. **Land requirement**: 403.9 ha (approx.)

Components	Tentative Area in Hectares
Forest Land	376.32
Non-Forest Land*	27.58
TOTAL LAND REQUIREMENT	403.90

The exact quantum of Private / Govt. land required shall be evaluated during survey and investigation and EIA/EMP studies.

iv. **Demographic details in 10 km radius of project area**: About 05 nos. of villages comprising 110 families (tentative) are likely to be affected due to the proposed Project. The socio-economic study aims to assess the overall impacts on various facets of socioeconomic environment due to establishment of the project. The information on various aspects of the affected population viz., demographic details, socio-economic and cultural characteristics, enumeration of personal properties of the affected population, education level and occupational profile etc. shall be collected besides ethnographic assessment of PAFs during the EIA & SIA study.

v. **Water requirement:** Pumped Storage projects do not generate any by-product during electricity generation. Hydroelectric power is generated by non-consumptive use of water.

vi. **Project Cost:** The estimated project cost is Rs. 6036.77 Crore. Total capital cost earmarked towards environmental pollution. control measures is approx. 2% to 3% of the estimated project cost. Detail allocation along with Recurring cost (operation and maintenance) shall be done after preparation of EIA/EMP study.

vii. **Project Benefit**: Setting up of the project shall reduced dependence on fossil fuels and promote Clean Energy generation along with overall economic growth, and enhancing energy security for both the state and the nation as a whole. It shall also generate employment in the rural area, boost local economies such as small markets, shops etc. Total employment as direct & indirect shall be taken up during later stages of development of the Project.

viii. **Environmental Sensitive area**: There are no National Parks, Wildlife Sanctuaries, Biosphere Reserves, Tiger, Wildlife Corridors etc. within IO km distance from the project site.

ix. **MoU/ any other clearance/ permission signed with State government:** GRIDCO, Govt of Odisha issued letter on dated 08.10.2025 in favor of NHPC for applying ToR and preparation of DPR**.**

x. **Muck Disposal:** Approx. 3.5 Lacs Cum. of Muck shall be disposed of in the designated muck dumping sites. A Muck Disposal Plan shall be prepared as part of Environmental Management Plan.

xi. **Resettlement and rehabilitation:** A comprehensive R&R scheme shall be prepared for project affected families (PAFs) by the District Admin. as part of the land acquisition process under RFCTLARR Act, 2013. Also, community development activities of the Project under other heads (such as CSR scheme) are also expected to be beneficial for the local people residing in and around Project area.

xii. **Alternative Studies:** Developing and assessing various alternative schemes is one of the first activities during the preparation of the DPR. Various alternative studies have been carried out for arriving at the most optimal location & layout of the Project. While carrying out the PFR, three alternative sites have been studied and alternative 2 is found suitable, which will be investigated further during DPR preparation.

xiii. **Details of Solid waste/ Hazardous waste generation/ Muck and its management:** Sewage and solid waste shall be generated from project colonies during construction as well as operational phase. Solid waste generated from temporary and permanent colonies during construction as well as operation phase shall be disposed off as per the Solid Wastes Management Rules (SWM), 2016. Hazardous waste if generated, shall be handled as per Hazardous Waste Management Rules, 2016.

xiv. Status of Litigation Pending against the proposal, if any.: Nil

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

- **Project details:**

Name of the Proposal	TOR Approval for Masinta off stream closed loop PSP, Distt Deogarh, Odisha
Location (Including coordinates)	Tehsil Barkot and District Deogarh, Odisha Lat. 21°37'13"N, Long. 84°56'13"E
Inter- state issue involved	No
Seismic zone	Zone-III

- **Category details:**

Category of the project	1(c) River Valley/Irrigation projects Sector : RIV
Provisions	A Pumped Storage Project with the objective of power generation.
Capacity / Cultural command area (CCA)	1000 MW

Attracts the General Conditions (Yes/No)	No
Additional information (if any)	Nil

- **Electricity generation capacity:**

Powerhouse Installed Capacity	1000 MW
Generation of Electricity Annually	2080.5 MU
No. of Units	4 Units (4x 100) = 1000 MW
Additional information (if any)	Nil

- **ToR/EC Details:**

Cost of project	Rs. 6036.77 Crore
Total area of Project	403.9 Ha (Tentative)
Height of Dam from River Bed (EL)	Upper Dam: 54 m Lower Dam: 20 m
Length of Tunnel/Channel	Pressure shaft 4 nos of 1043 m each
Details of Submergence area	375 Ha (tentative)
Types of Waste and quantity of generation during construction/ Operation	Pumped Storage projects do not generate any waste bye-product during electricity generation. Hydroelectric power is generated by non-consumptive use of water. However, during construction phase of the project, about 200 KLD per day of waste water; approximately 3.5 lakh cum of muck shall be disposed off in the designated muck dumping sites. A detailed muck disposal plan shall be prepared during EIA study in line of Standard TOR.
E-Flows for the Project	Not applicable on off stream PSPs.
Is Projects earlier studies in Cumulative Impact assessment & Carrying Capacity studies (CIA&CC) for River in which project located. If yes, then	Not applicable. **Masinta PSP is off stream closed loop PSP.**
a) E-flow with TOR /Recommendation by EAC as per CIA&CC study of River Basin.	Not applicable.
b) If not the E-Flows maintain criteria for sustaining river ecosystem.	Not applicable.

- **Muck Management Details:**

No. of proposed disposal area/(type of land-Forest/Pvt. land)	Around 10 ha of area will be required for muck dumping. The exact number and area shall be decided during survey and investigation and will be incorporated in EIA studies.
Muck Management Plan	Shall be prepared in EMP based on EIA studies.
Monitoring mechanism for Muck Disposal	Shall be prepared in EMP based on EIA studies

- **Land Area Breakup:**

Private land / Non Forest Land	27.58 (Tentative)
Government land or Forest Land	376.3 Ha (Tentative)
Submergence area/Reservoir area	375 ha (Tentative)
Total Land	403.9 Ha
Additional information (if any)	The quantity of Forest Land & Non Forest Land shall be finally firmed up at the time of actual survey and EIA/EMP studies.

- **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 Reserved as well as unclassified Forest is involved.	No Protected area/ESZ falls within the 10 Km radius of project component including the reservoir
National Park	No	
Wildlife Sanctuary	No	

- **Court case details:** Nil

- **Miscellaneous**

Particulars	**Details**
Details of consultant	Hiring of consultant is under process.

Project Benefits	Clean and green power generation of 2080 million units annually. Benefit Under R&R plan; Reduced dependence on Fossil Fuels; Clean Energy Generation; Economic Development; Sustainable Development, promoting economic growth, and enhancing energy security for both the state and the nation as a whole.
Status of other statutory clearance	In the process of applying to concerned Directorate / Department of GOI/ GoAP
R&R details (Tentative)	No. of Villages : 05 Nos. of PAFs : 110 (Tentative) R&R Plan: Shall be firmed up during SIA study.
Additional detail (if any)	-

43.2.3 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 Masinta Closed Loop Pumped Storage Project (1000 MW) in an area of 403.9 Ha located at Village Kadapada, Kantapali, Kulsra, etc, Sub District Barkot, District Deogarh, Odisha by M/s NHPC 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.

- During the deliberations the committee noted that the upper reservoir is off-stream and lower reservoir is on small stream (non-perennial). Since lower reservoir is situated on small natural nallah/stream, the committee opined that the project shall be categorized as an open-loop project rather than a closed-loop PSP. Further, during the meeting, the PP informed that the water received from the catchment would be released downstream into the river. The EAC was of the view that the non-perennial small streams/nallahs play an important role in ecosystem stability through supporting unique, adapted communities and provide critical habitat, especially during dry periods. They are hotspots for biodiversity and vital for maintaining ecosystem services. Accordingly, the

EAC advised to prepare suitable action plan for sustenance of the natural nallahs/streams after having detailed analysis of catchment yield and requirement of water for maintaining ecosystem services.

- The EAC noted that the total land requirement for the project is around 403.90 ha, out of which 27.58 ha is non-forest land and 376.32 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. The EAC noted that the forest area falling within and around the project site comprises a very dense canopy, indicating a mature and ecologically sensitive forest ecosystem. Such dense canopy cover suggests the presence of significant biodiversity, including large trees, undergrowth, and potential habitats for wildlife species. The Committee emphasised the need for detailed survey of the study area to collect appropriate data on wild flora and fauna so that impact prediction can be done accurately considering the aspects like fragmentation of habitat, and disruption of ecological functions etc. Further, there are no National Park, Wildlife Sanctuary, Biosphere Reserve, Tiger, Wildlife Corridor etc. within 10 km distance from the project site.

- The water requirement will be met from the existing Rengali Reservoir, which is located about 12 km from the upper reservoir 17.55 MCM for initial filling and 4.70 MCM for annual recoupment. The EAC observed that the evaporation loss calculations appear to be significantly high and need to be re-examined by the PP. In case such high annual water requirement is confirmed, the PP may explore suitable technologies to mitigate evaporation losses, such as installation of floating solar panels on the upper and lower reservoirs.

- While discussing the alternatives studied by the PP, the EAC observed that only a limited number of environmental concerns were considered while finalizing the site. The Committee also noted that site clearance approval has been obtained by the PP from CWC/CEA. Therefore, the PP shall prepare stringent measures to preserve the environment and ecology of the area.

43.2.4 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 Masinta Closed Loop Pumped Storage Project (1000 MW) in an area of 403.9 Ha located at Village Kadapada, Kantapali, Kulsra, etc, Sub District Barkot, District Deogarh, Odisha by M/s NHPC Limited, under the provisions of EIA Notification, 2006, as amended along with the following additional/specific ToR:

[A] Environmental Management and Biodiversity Conservation:

i. 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.

ii. 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.

iii. The inter-state issues (if applicable) of Rengali reservoir located in Brahmani river basin near Deogarh District, Odisha shall also be examined by the CWC.

iv. The PP will submit a 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 376.32 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.

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. In case any other project is present on the river, Cumulative Impact of projects in the basin on carrying capacity and sustainability of Reservoir/ River /nala of catchment area due to tapping of water for filling reservoir shall be studied.

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 three seasons.

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

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

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

xxi. 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.

[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.

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

ANNEXURE

ATTENDANCE

S. No.	Name of Member	Role
1.	Prof. Govind Chakrapani	Chairman
2.	Dr. Uday Kumar R Y	Member
3.	DR. J. V. Tyagi	Member
4.	Shri Ajay Kumar Lal	Member
5.	Dr. Mukesh Sharma	Member
6.	Shri Rakesh Goyal	Member Representative of Central Electricity Authority (CEA)
7.	Shri Balram Kumar	Member Representative of Central Water Commission (CWC)
8.	Dr. A.K. Sahoo	Member Representative of CIFRI
9.	Shri Yogendra Pal Singh	Member Secretary

APPROVAL OF THE CHAIRMAN

========== Forwarded message ==========
From: chakrapani govind <chakrapani.govind@gmail.com>
To: "Yogendra Pal Singh"<yogendra78@nic.in>
Cc: "Dr Krishnendu Mondal"<krishnendu.mondal@gov.in>
Date: Mon, 17 Nov 2025 16:21:57 +0530
Subject: Re: Draft MOM of 43rd EAC (RVHEP) meeting held on 12.11.2025-reg.
========== Forwarded message ==========

Approved.
Chakrapani

On Mon, 17 Nov, 2025, 3:53 pm Yogendra Pal Singh, <yogendra78@nic.in> wrote:

> Dear Sir,
>
> The observations raised by you and representative CWC have been addressed and suitable TOR (highlighted in yellow) framed accordingly. The modified draft MOM are attached herewith for your approval please.
>
> With Regards,
>
> **Yogendra Pal Singh**
> **Scientist 'F'**
> **Government of India**
> **M/o Environment, Forest and Climate Change**
> **Room No. 236, 2nd Floor, Vayu Wing**
> **Indira Paryavaran Bhawan**
> **Jor Bagh, New Delhi-110003**
> **Tele-fax: 011-20819364**