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

Minutes of AGENDA FOR 27TH MEETING OF EXPERT APPRAISAL COMMI TTEE meeting River Valley and Hydroelectric Projects held from 27/03/2025 to 27/03/2025 **Date:** 13/04/2025

MoM ID: EC/MOM/EAC/834092/3/2025

Agenda ID: EC/AGENDA/EAC/834092/3/2025

Meeting Venue: INDIRA PARYAVARAN BHAWAN, NEW DELHI

Meeting Mode: Physical

Date & Time:

27/03/2025	10:30 AM	02:30 PM

1. Opening remarks

The 27th meeting of the EAC for River Valley & Hydro-electric Projects was held on 27th March, 2025, under the Chairmanship of Prof. G. J. Chakrapani in the Ministry of Environment, Forest and Climate Change, Indira Paryavaran Bhawan, Jor Bagh Road, New Delhi.

2. Confirmation of the minutes of previous meeting

The Minutes of the Meeting held on 24th EAC meeting on 14thMarch, 2025 were confirmed.

3. Details of proposals considered by the committee

Day 1 -27/03/2025

3.1. Agenda Item No 1:

3.1.1. Details of the proposal

Kotpali Pumped Storage Hydro-electric Project (1800 MW) by **CHHATTISGARH STATE POWER GENERAT ION COMPANY LIMITED** located at **BALRAMPUR,CHHATTISGARH**			
Proposal For		Fresh ToR	
Proposal No	**File No**	**Submission Date**	**Activity (Schedule Item)**
IA/CG/RIV/520918/2025	J-12011/11/2025-IA.I (R)	04/03/2025	River Valley/Irrigation project s

			(1(c))

3.1.2. Project Salient Features

27.1.1 The proposal is for grant of Terms of References (ToR) to the project for Kotpali Close loop Pumped Storage Hydro-electric Project (1800 MW) in an area of 357 Ha located at Village Joka, Pendirdih and Samri Protected Forest, Sub District Shankargarh, District Balrampur, Chhattisgarh by M/s Chhattisgarh State Power Generation Company Limited.

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

i. The proposed Kotpali Pumped Storage Hydro-electric Project (1800 MW) envisages utilization of available head between proposed upper dam and lower dam. An Underground Power House (UGPH) will be located in between two reservoirs. Both the reservoirs will be interconnected through water conductor system and the generator and turbines installed at the power house.

ii. The proposed Kotpali Pumped Storage Project of lower reservoir and upper reservoir is located near village Rakhia and Tuthdipa of Jokhapat Panchayat, Tehsil Shankarghad, District Balrampur which is situated the northern part of Chhattisgarh. The project falls in 23°21'12.35"N, 83°38'46.75"E (Lower Reservoir) and 23°23'9.32"N, 83°39'23.11"E (Upper reservoir).

iii. The Kotpalli pumped storage project (PSP) is an off-stream closed-loop pumped storage scheme. In off-stream closed loop stream none of the reservoirs is located on any river/stream/nallah. Kanhar river passes by the Kotpalli pumped storage project.

iv. **Land requirement:** The total land to be acquired for the project is approximately 357 hectares. Based on the site visit and preliminary secondary data available, most of the land required is coming under private as well as forest.

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

- **Population:** As of 2011, the population of Balrampur district was 7,30,491. The population density is 100 people per square Kilometer.
- Sex ratio: The sex ratio in Balrampur was 973 females per 1000 males.
- Literacy rate: The literacy rate in Balrampur district is 57.98%.
- Urban vs rural: 4.75% of the population lives in urban areas, and 95.25% live in rural areas.
- Scheduled Castes and Scheduled Tribes: Scheduled Castes and Scheduled Tribes made up 4.48% and 62.83% of the population respectively.

vi. **Water requirement:** There is an additional requirement of 1.75 MCM annually apart from one time filling water requirements of 15.51 MCM will be met from the Kanhar River.

vii. **Project Cost:** The cost of Project is Rs. 7550.82 Crores at PFR Stage.

viii. **Project Benefit:** The scheme would afford on annual peaking period energy generation of 3958.75 GWh annually considering the project operation for one cycle for 6 hours 1.53 minutes peaking per day with design energy generation of 3760.82 GWh, calculated with 95% capacity availability. However, project can also generate 5938.13 GWh annually considering the project operation for one and half cycle for 9 hours 2.29 minutes peaking per day with design energy generation of 5641.22 GWh, calculated with 95% capacity availability.

ix. **Environmental Sensitive area:** There are "NO" national parks, wildlife sanctuaries, Biosphere Reserves, Tiger/Elephant Reserves, Wildlife Corridors etc. within 10 km distance from the project site. River/ water body Kanhar River is flowing at a distance (Arial) of 06 Km in North direction.

x. **Resettlement and rehabilitation:**

In Kotpali site approx. 70 - 75 households are affected in the project area as per the preliminary study and the details are as below.

1. U/R – 65-70 Households
2. HRT Intake – 3-5 Households

xi. **Status of Litigation Pending against the proposal, if any.**

xii. The salient features of the project are as under**:**

1. **Project Details**:

Name of the Proposal	Kotpali Off-Stream Close Loop Pumped Storage H ydro-electric Project (1800 MW)
Location (Including coordinates)	Village Joka, Pendirdih and Samri Protected Fores t, Sub District Shankargarh, District Balrampur, C hhattisgarh. The upper reservoir falls in 23°23'9.32"N & 83°3 9'23.11"E and Lower Reservoir falls in 23°21'12.3 5"N & 83°38'46.75"E respectively.
Inter- state issue involved	No
Seismic zone	Zone-II

2. **Category Details:**

Category of the project	A
Provisions	-
Capacity / Cultural command area (CC A)	1800 MW
Attracts the General Conditions (Yes/N o)	No
Additional information (if any)	-

3. **Electricity generation capacity:**

Powerhouse Installed Capacity	6 units of 300 MW each
Generation of Electricity Annually	3958.75 GWh for 1 cycle operation 5938.13 GWh for 1.5 cycle operation
No. of Units	6
Additional information (if any)	-

4. **ToR/EC Details:**

Cost of project	Rs. 7550.82 Crores
Total area of Project	357 Hectares
(Height of Dam from River Bed Level (EL))	Upper dam-23m Lower dam–55 m (Saddle dam–25 m)
Length of Tunnel/Channel	3390 m
Details of Submergence area	Non-Forest Land – 42 Hectare Forest Land – 145 Hectare

Types of Waste and quantity of generation during construction/ Operation	Sewage generated from Labour camps 400 KLD per day.
E-Flows for the Project	It is a pumped storage project; E flows will be governed from the proposed Lower dam.
Is Projects earlier studies in Cumulative Impact assessment & Carrying Capacity studies (CIA&CC) for River in which project located. If yes, then a) E-flow with TOR /Recommendation by EAC as per CIA&CC study of River Basin. b) If not the E-Flows maintain criteria for sustaining river ecosystem.	NA

5. **Muck Management Details:**

No. of proposed disposal area/ (type of land- Forest/ Pvt. land)	25 hectares (approx.) non-forest land
	Shall be taken up as part of DPR
	Shall be taken up as part of DPR

6. **Land Area Breakup:**

Private land	169 Hectares (Non Forest land)
	188 Hectares (Forest Land)
	187 Hectares
	277 Hectares
	-

7. **Presence of Environmentally Sensitive areas in the study area:**

Forest Land/ Protected Area/ Environmental Sensitivity Zone	Yes/No	Details of Certificate/letter/Remarks
	(Yes)	**Total Forest Land – 188 Ha** *(Protected Forest Land – 1**88 Ha**)*
	No	
	No	

8. **Court Case Details**: Nil

9. **Previous EC compliance and necessary approvals:**

Particulars	Letter no. and date

Certified EC compliance report (if applicable)	-
Status of Stage- I FC	-
Additional detail (If any)	-
Is FRA (2006) done for FC-I	-

10. **Miscellaneous:**

Particulars	Details
Details of consultant	M/s WAPCOS Limited
Project Benefits	Hydro-electric power and Employment generation
Status of other statutory clearances	-
R&R details	Total 70-75 Households (U/R – 65-70 Households HRT Intake – 3-5 Households)
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 to the project for conducting EIA/EMP and Public hearing for Kotpali Close loop Pumped Storage Hydro-electric Project (1800 MW) in an area of 357 Ha located at Village Joka, Pendirdih and Samri Protected Forest, Sub District Shankargarh, District Balrampur, Chhattisgarh by M/s Chhattisgarh State Power Generation Company Limited.

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

The EAC noted that the total land required for the proposed project is estimated to be 357 hectares (ha), comprising 169 ha of non-forest land and 188 ha of forest land. 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 Project Proponent indicated that there are no national parks, wildlife sanctuaries, Biosphere Reserves, Tiger/Elephant Reserves, or Wildlife Corridors within a 10 km radius of the project site. However, it was noted that the Semarsot Wildlife Sanctuary is located 10.5 km from the proposed project boundary. Additionally, the committee observed that the land requirement for road construction is 35 hectares, primarily due to the construction of wide roads, which could potentially be optimized.

The EAC further noted that the total water requirement for the project is 1.75 MCM annually, in addition to a one-time filling water requirement of 15.51 MCM, which will be sourced from the Kanhar River. The EAC expressed concerns regarding the water allocation for the project, as it was observed that several other projects are already planned downstream of the proposed site. As a result, the EAC advised that any interstate issues, water availability, and water-sharing matters should be resolved with the competent authorities before proceeding with the proposal. Furthermore, the Project Proponent was instructed by the EAC to conduct a detailed study on water utilization by downstream users and its potential impact on the river survival and region's ecosystem. To ensure long-term sustainability, the EAC recommended that a comprehensive Water Utilization Mapping be carried out within a 10 km radius of the project site. This study should include:

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

During its deliberations, the EAC observed that the lower reservoir for the project is planned to be filled by creating a storage on a tributary of the Kanhar River, through the construction of a weir and the installation of a pipe system to connect the weir to the proposed Lower Dam. The EAC noted that, as informed by the Project Proponent, the lower reservoir is located on the tributary of the Kanhar River. Accordingly, the the project should be classified as an Open Loop project, rather than a Closed Loop project.

Additionally, the EAC raised serious concern over the construction of weir for one time filling of the reservoir which will be carried out in two monsoon season, afterwards weir will of no use and eventually it will effect downstream users, so it was stated that there shall no need for diverting the flow of the river. Therefore, it was advised to change the layout for connecting a pipe system to fill water in the reservoir.

27.1.4 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 Open Loop Pumped Storage Projects vide OM dated 14.08.2023 for conducting EIA study for proposed construction of the project for Kotpali Open loop Pumped Storage Hydro-electric Project (1800 MW) in an area of 357 Ha located at Village Joka, Pendirdih and Samri Protected Forest, Sub District Shankargarh, District Balrampur, Chhattisgarh by M/s Chhattisgarh State Power Generation Company Limited, under the provisions of EIA Notification, 2006, as amended along with the following additional/specific ToR

3.1.5. Recommendation of EAC

Recommended

3.1.6. Details of Terms of Reference

3.1.6.1. Specific

Environmental Management and Biodiversity Conservation	
1.	PP shall submit the Water Utilization Mapping within a 10 km radius of the project for sustainability of ecosystem of the region.
2.	Action plan for survival or diversion of the rivulets/stream, if any, leading to join Reservoir and Kanhar River shall be submitted.
3.	Detailed action plan for large scale plantation of native species of plant sapling within 10 km radius of the project shall be prepared in consultation with State Forest Department. The monitoring

	mechanism to ensure the survival of saplings shall be finalised in consultation with ICFRE.
4.	PP shall carried out detail study on number of Sal tress available in the study area and number of them that will be felled for the conduction of the project.
5.	Explore the possibilities for reducing the Forest land requirement. The application for obtaining Stage I FC for 188 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.	PP shall submit the detailed plan for filling the reservoir from the Bahula reservoir Kanhar River along with necessary approval form water resource department. Necessary clearance/ approval for interstate issues/ water availability/water sharing issues shall be obtained.
9.	Transportation Plan for transporting construction materials shall be submitted.
10.	Environmental Cost Benefit Analysis shall be done in terms of loss of Forest ecosystem due to diversion of Forest land/loss of biodiversity, water availability, water uses for generation of hydro power and Ecological flows.
11.	The baseline data collection will cover the changes in biological and ecological profile of the region after monsoon with worst-case scenario study and critical mineral assessment.
12.	Calculation and values of GHGs (CO2, CH4 etc.) emissions during construction and during operation till the life of the project shall be estimated and submitted.
13.	The longitudinal connectivity/Free flowing sketch be provided in the EIA/EMP report. Presence of any critical mineral zone in the proposed area be clarified from GSI.
14.	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.
15.	Quantitative values of Impact modelling of environmental parameters shall be submitted for during construction and operation. Also, mitigation measures shall be submitted in terms of construction and operation phase.
16.	Conducting site-specific ecological study emphasizing on riverine ecology viz. fishes diversity, fish migration, habitat and aquatic biota due to construction PSP. Impact assessment on the fish diversity based on the hydrological alteration at the water drawing sources shall be studied.
17.	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.
18.	Impact zone decided prior to base line data generation and accordingly, sampling location shall be finalized. Baseline data as mentioned in Specific ToR shall be collected for preparation of EIA/ EMP report along with soil characteristics which shall be studied at minimum 10 locations. The ground water level at 10 locations shall be measured in project area in all three seasons.

19.	A study shall be carried out on impact of project activity on the aquatic and terrestrial ecosystem, within project area classifying the impact zones (highly impact/low impact zone) based on seasonal variations and covering the aspects related to impacts on aquatic ecosystem/ primary productivity due to quantity of water to be lifted for power generation and thermal stratification. Accordingly, Environment Management plan shall be prepared.
20.	Reservoir/ River banks protection plan all along the submergence need to be prepared and incorporated in EIA/ EMP.
21.	Scope of watershed development in the 10 km radius of the project shall be studied in consultation with Indian Council of Agriculture Research (ICAR) Institutes/ Expert Govt. institutions and accordingly a detailed Water Shed Development Plan shall be prepared and incorporated in EIA/ EMP report.
22.	Any archaeological sites in the vicinity of the project, if any, then it shall be certified by ASI.
Socio-economic Study	
1.	Declaration by the project proponent by way of affidavit that "No" Inter-state issue/ policy issue is involved with any State in the project.
2.	All the tasks including conducting public hearing shall be done as per the provisions of EIA Notification, 2006 and as amended from time to time. A comparative chart of issues raised by General Public during Public Hearing and commitments made by the Project Proponent will be prepared and submitted in the relevant chapter of EIA/EMP report.
3.	PP shall submit the credible documents to show the status of land acquisition w.r.t project site from/through the concerned State Government as required under Ministry's OM dated 7th October, 2014 for the project land to be acquired.
4.	Land acquired for the project shall be suitably compensated in accordance with the law of the land with the prevailing guidelines. Private land (if any) shall be acquired as per provisions of Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013. Budget earmarked for R&R, CSR shall not be included in the cost of EMP.
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.
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.
Miscellaneous	
1.	Both capital and recurring expenditure under EMP shall be submitted.
2.	Pre-DPR Chapters viz. Layout Map and Power Potential Studies duly approved by CWC/CEA shall be submitted.
3.	The PP should submit the photograph of monitoring stations & sampling locations. The photograph should bear the date, time, latitude & longitude of the monitoring station/sampling location. In addition to this PP should submit the original test reports and certificates of the labs which will analyze the samples.
4.	Drone video of project site shall be recorded and to be submittted.
5.	Undertaking need to be submitted on affidavit stating that no activities has been started on the project site.
6.	Detailed plan to restore wider roads and convert them into narrow up to 10m after construction of the project.
7.	Specific Terms of Reference (ToRs) issued by the Ministry vide Office Memorandum No. F. No. IA3-22/33/2022-IA.III dated 14.08.2023 for Pumped storage projects shall be used for preparation of EIA/ EMP reports.
8.	As per Ministry's OM dated 1st August, 2013, PP shall submit application to obtain prior approval of Central Government under the Forest Conservation Act, 1980 for diversion of forest land required for such projects will be submitted as soon as the actual extent of forest land required for the project is known to the project proponent, and in any case, within 6 months of issuance of ToR. However, no proposal will be put up before EAC without submission of application for forest clearance, wherever applicable.

3.1.6.2. Standard

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

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

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

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

	Total coliform) and (iv) Heavy Metals (Pb, As, Hg, Cd, Cr-6, total Cr, Cu, Zn, Fe) (6 locations).
20.	Delineation of sub and micro-watersheds, their locations and extent based on the All India Soil and Land Use Survey of India (AISLUS), Department of Agriculture, Government of India. Erosion levels in each micro-watershed and prioritization of micro-watershed through silt yield index (SYI) method of AISLUS
21.	Hydro-Meteorology of the project viz. precipitation (snowfall, rainfall), temperature, relative humidity, etc. Hydro-meteorological studies in the catchment area should be established along-with real time telemetry and data acquisition system for inflows monitoring.
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.
1	Sanitation and Solid waste management plan for domestic waste from colonies and labour camps etc.

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

3.2. Agenda Item No 2:

3.2.1. Details of the proposal

Pinnapuram Integrated RESP by **GREENKO AP01 IREP PRIVATE LIMITED** located at **NANDYAL,ANDHRA PRADESH**			
Proposal For		Amendment in EC	
Proposal No	**File No**	**Submission Date**	**Activity (Schedule Item)**
IA/AP/RIV/530047/2025	J-12011/12/2018-IA.I (R)	18/03/2025	River Valley/Irrigation projects (1(c))

3.2.2. Project Salient Features

27.2.1 : The proposal is for grant of amendment in Environmental Clearance to Pinnapuram Integrated RESP-Storage project (1200 MW) in Sub District Gadivemula, Orvakal, Panyam, District Nandyal and Kurnool, Andhra Pradesh by M/s Greenko AP01 IREP Private Limited.

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

i. The proposal is for amendment in the Environmental Clearance granted by the Ministry Vide letter dated 14.07.2020 for the project Pinnapuram Integrated RESP-Storage Project located at in village Pinnapuram, Brahmanapalle & Gutum Thanda, Tehsil Panyam & Orvkal, District Nandyal & Kurnool, Andhra Pradesh in favour of M/s Greenko AP01 IREP Private Limited (Previously Greenko Energies Private Limited).

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

S. No.	Para of EC issued by MoEF&CC	Details as per the EC	To be revised/ read as	Justification/ reasons
1	Subject	Pinnapuram Integrated RESP-Storage (1200 MW) in Tehsil Nandyal, District	Pinnapuram Integrated RESP-Storage (1680 MW) in Tehsil Panyam in District	Transfer of EC in the name of M/s Greenko AP01 IREP Private Limited and Ca

S. No.	Para of EC issued by MoEF&CC	Details as per the EC	To be revised/ read as	Justification/ reasons
		Kurnool, Andhra Pradesh by M/s Greenko Energies Private Limited	Nandyal and Tehsils Panyam and Gadvemula in District Kurnool, Andhra Pradesh by M/s Greenko AP01 IREP Private Limited	pacity Enhancement. As per the latest topographical survey the reservoir levels have been optimized corresponding to the required storage capacities without changing the location
2	Point No. 3	storage capacity of 1200 MW/9600 MWH for 08 hours.	storage capacity of 1680 MW/9304.40 MWH for 5.54 hours.	As per the latest topographical survey the reservoir levels have been optimized corresponding to the required storage capacities without changing the location
3	Point No. 5	1.2 TMC for facilitating 8 hour storage capacity.	1.30 TMC for facilitating 5.54 hour storage capacity.	Without changing the project reservoir shape and levels the storage capacity reworked out to 1.30 TMC. The same shall be used for recirculation for generation & pumping vice versa as non-consumptive reutilization.
4	Point No. 5	The FRL and gross storage capacity of Upper Reservoir are EL +463.00M and 1.37 TMC	The FRL and gross storage capacity of Upper Reservoir are EL +460.80M and 1.697 TMC	As per the latest topographical survey the reservoir levels have been optimized corresponding to the required storage capacities without changing the location.
5	Point No. 5	The FRL and gross storage capacity of Lower Reservoir are EL +340.00M and 1.42 TMC	The FRL and gross storage capacity of Lower Reservoir are EL +335.10M and 1.55 TMC	As per the latest topographical survey the reservoir levels have been optimized corresponding to the required storage cap

S. No.	Para of EC issued by MoE F&CC	Details as per the EC	To be revised/ read as	Justification/ reasons
				acities without changing the location.
6	Point No. 5	The scheme envisages construction of rock fill embankment of average height around 12m to 14m and with maximum height of 35m in Upper Reservoir & 33m in Lower Reservoir for short reach	The scheme envisages construction of Rock Fill Embankment dam with PVC Geo Membrane Facing (GFRD of average height around 12 m to 14m and with maximum height of 40m in Upper Reservoir & 38 m in Lower reservoir for short reach	The type of dam changed to PVC Geomembrane Faced Rockfill Dam (GFRD) from the earlier proposed rockfill dam due to shorter construction period, less maintenance, easy connection to concrete surface, higher placing rate and resistance against wind uplift and the high drawdown rate of reservoir. In both the dams, the fill material is the rockfill and hence there is no change in the material type.
7	Point No. 5	45m High RCC Intake structure	41.80 m (covered with RCC slab at top up to Intake Gate)	Due to reconfiguration
8	Point No. 5	6 nos. of 760 m long and 7.0m dia. inclined circular steel lined Penstock / Pressure Shaft five each for each unit of 200 MW and one bifurcated into 2 penstocks to feed 2 units of 100 MW.	7 nos. of 652.91 m long and 7.5m dia. inclined circular steel lined Penstock / Pressure Shaft six each for each unit of 240 MW and one bifurcated into 2 penstocks to feed 2 units of 120 MW.	The project capacity has been enhanced to 1680 MW by adding one more unit. which requires additional Penstock/pressure shaft. Thus, the total no of penstock/ pressure shaft are 7
9	Point No. 5	A surface Power house having an installation of 5 each of 200 MW capacity and 2 each of 100 MW capacity; operating under a rated head of 119.27 m in ge	A surface Power house having an installation of 6 each of 240 MW capacity and 2 each of 120 MW capacity; operating under a rated head of 120.13 m in ge	Enhancement of installed capacity from 1200 MW to 1680 MW requires installation of one additional pump turbines i.e. number of total units has increased fr

S. No.	Para of EC issued by MoEF&CC	Details as per the EC	To be revised/ read as	Justification/ reasons
		nerating mode and 125.77 m in pumping mode.	nerating mode & 128.63 m in pumping mode.	om 7 to 8.
10	Point No. 5	70m wide concrete lined Tail race channel with FSD of 6.00 m and 1300 m long connecting Tail race channel to the lower reservoir.	20.88 m wide (Finished bed width) Concrete Lined tail race channel with FSD of 12.80 m and 1614.11 m long connecting Tail race tunnel to the lower reservoir.	Due to reconfiguration.
11	Point No. 6	Land requirement of 713.65 Ha in which 365.66Ha of forest land, 119.65Ha Private land and 228.34Ha of Government land.	Land requirement of 785.58 Ha in which 415.83 Ha of forest land, 192.02 Ha Private land and 177.73Ha of Government land.	Due to change in realignment and reconfiguration.
12	Point No. 6	MOEFCC has issued in-principal approval for diversion of 365.66 ha forestland	365.66 ha forest land has been approved by MOEFCC and proposal for diversion of an additional 50.17 ha forest land is filed vide FP/AP/HYD/IRRIG/462719/2024 dated 02.03.2025	Due to change in alinement and reconfiguration.
13	Point No. 6	Total Cost of Project is about Rs.5468.03 Crores	Total Cost of Project is about Rs.9523.01 Crores	The cost of the project has been increased due reconfiguration.

Pinnapuram Integrated RESP-Storage project with 1200 MW installed capacity was accorded environment clearance on 14/07/2020. The project was designed for 8.0 hours of peak generation duration with 1200 MW installed capacity to create a storage capacity of 9600 MWH. As per the power grid requirement, PSPs should be designed for about 6 hours peak supply on daily basis. During detailed engineering and optimization exercise, project installed capacity was revised to 1680 MW with corresponding changes in project parameters. The project operation duration has been optimized to 5.54 hours daily. Keeping the storage capacity close to earlier designed value, the installed capacity is revised to 1680 MW, which will give a storage capacity of 9304.40

MWH. Additional 71.93 ha of land (50.17 ha forest land and 72.37 ha private land including reduction in government land by 50.61 ha) is involved for the amendment proposal

During detailed engineering design, keeping in view the further geological investigation, layout has been optimized to achieve 1680 MW installed capacity.

S.No		Description	Existing Salient Features	Now Proposed
		Installed Capacity of Project	**1200 MW**	**1680 MW**
1		**NAME OF THE PROJECT**	Pinnapuram Integrated RESP – Storage Project (1200 MW)	Pinnapuram Integrated RESP – Storage Project (1680 MW)
2		**Location**		
	a	Country	India	Unchanged
	b	State	Andhra Pradesh	
	c	District	Kurnool	
	d	Village near Power House	Pinnapuram	
3		**Geographical Co- Ordinates**		
	a	**Upper Reservoir**		
		Latitude	15° 36’ 26" N	Unchanged
		Longitude	78° 15’ 13" E	
	b	**Lower Reservoir**		
		Latitude	15° 37’ 26" N	Unchanged
		Longitude	78° 15’ 30" E	
4		**Access To Project Site**		
	a	Airport	Hyderabad	Unchanged
	b	Rail head	Kurnool – 81 Kms	
	c	Road	Gorakallu	
	d	Port	Krishnapatnam	
		Project		

S.No		Description	Existing Salient Features	Now Proposed
		Installed Capacity of Project	**1200 MW**	**1680 MW**
5	a	Type	Pumped Storage Project	Pumped Storage Project
	b	Storage Capacity	9600 MWH	9304.40 MWH
	c	Rating	1200 MW	1680 MW
	d	Peak operation duration	8.00 Hours daily	5.54 Hours daily
6		**Pinnapuram Reservoir - Upper**		
	a	Live Storage	1.20 TMC	1.126 TMC
	b	Dead Storage	0.17 TMC	0.571 TMC
	c	Gross Storage	1.37 TMC	1.697 TMC
	d	Top of Dam	EL + 466.00 m	EL +466.00 m
	e	Full Reservoir level (FRL)	EL + 463.00 m	EL +460.80 m
	f	Min. Draw Down Level (MDDL)	EL + 441.50m	EL +445.50m
	g	Height of RCC Intake Structure	45.0 m	-
	h	Max Height of Embankment	35.0m	40.0 m
	i	Top Width of Embankment	10.0 m	7.0 m
	J	Length of Rock Fill Embankment dam with PVC Geo Membrane Facing (GFRD)		6724 m
	k	Type of Embankment	Rockfill Dam with Central Clay Core	Rockfill Dam with PVC Geo Membrane Facing (GFRD)
7		**Pinnapuram Reservoir - Lower**		
	a	Live Storage	1.20 TMC	1.118 TMC

S.No		Description	Existing Salient Features	Now Proposed
		Installed Capacity of Project	**1200 MW**	**1680 MW**
	b	Dead Storage	0.22 TMC	0.432 TMC
	c	Gross Storage	1.42 TMC	1.550 TMC
	d	Top of Dam	EL + 343.00 m	EL +340.00 m
	e	Full Reservoir level (FRL)	EL + 340.00 m	EL +335.10 m
	f	Min. Draw Down Level (MDDL)	EL + 321.00 m	EL +321.80m
	g	Length of Rock Fill Embankment dam with PVC Geo Membrane Facing (GFRD)		3316m
	h	Max Height of Embankment	33.0 m	38.0 m
	i	Top Width of Embankment	10.0 m	7.0 m
	j	Type of Embankment	Rockfill Dam with Central Clay Core	Rock Fill Embankment dam with PVC Geo Membrane Facing (GFRD)
8		**Approach Channel & Collection**		
	a	Type of Channel		Concrete Lined with Trapezoidal Shape
	b	Length of the approach channel		868.50 m
	c	Bed Width		190 m
	d	Full Supply Depth		9.00 m
	e	Bed fall		Flat Channel
	f	Side Slope of the Channel		1V:2H
	g	Design Discharge		1589.26 m^3/s

S.No		Description	Existing Salient Features	Now Proposed
		Installed Capacity of Project	**1200 MW**	**1680 MW**
9		**Intake Structure**		
	a	Type		Diffuser Type
	b	Number of Vents		7 Nos.
	c	Size of Each Intake		27 m (W) x 10.97 m (H) including piers
	d	Length of each Intake		41.80 m (covered with RCC slab at top up to Intake Gate)
		Elevation of Intake center line	EL + 429.24 m	EL +432.70 m
	b	Elevation of bell mouth bottom	EL + 423.71 m	EL +428.95 m
	g	Design Discharge of each Intake (Turbine mode)		230.80 Cumec for units- 7 & 8 226.41 Cumec each for units- 1 to 6
	h	Trash rack type		Vertical with inclination of 15°
	i	Size of Trash Rack		3 nos. of 8.00m(W) x 10.97m(H) for each unit.
	j	Velocity through Trash rack		1.01 m/s
	k	Numbers & Size of Intake Service Gate		7 Nos. - 6.2 m (W) x 7.5 m (H) Vertical Lift Fixed Wheel type with Independent Rope Drum Hoist
	l	Numbers & Size of Intake Maintenance Gate		7 No. - 6.2 m (W) x 7.5 m (H) Vertical Lift Fixed Wheel type with Independent Rope Drum Hoist
		Water Conductor System		

S.No		Description	Existing Salient Features	Now Proposed
		Installed Capacity of Project	**1200 MW**	**1680 MW**
10	I	**Intake Tunnel (up to Exit portal)**		
	a	Type		Steel lined — circular
	b	Number of Tunnels		7 Nos.
	c	Diameter of Each Tunnel		7.5 m dia.
	d	Length of Tunnel		80.23 m each
	e	Design Discharge of each Tunnel		230.80 Cumec for units- 7 & 8 226.41 Cumec each for units- 1 to 6
	f	Velocity in the Tunnel		5.22 m/sec for unit 7 & 8 5.12 m/sec for unit 1 to 6
	g	Thickness of Steel Liner		20mm
	h	Grade of Steel Plate		IS: 2002 — Gr. 2
	II	**Buried Penstock (from Exit portal to start of Vertical Pressure Shaft)**		
	a	Type	Steel lined - circular	Circular
	b	Number of Penstock	5 Nos Independent Penstocks and 1 No of Independent Penstock bifurcated in to 2	7 Nos Independent Penstocks and 1 No of Independent Penstock bifurcated into 2
	c	Diameter of Penstock	7.0 m	7.5 m dia.
	d	Length of Penstock up to Vertical Shaft	760.0 m each	314.70 m (for Units-7 & 8) 333.18 m each (for Units-1 to 6)
	e	Thickness of Steel Liner		20 mm to 28 mm & 25 mm
	f	Grade of Steel Plate		IS:2002-Gr.2, Gr.3 & ASTM A 537 Cl.2

S.No		Description	Existing Salient Features	Now Proposed
		Installed Capacity of Project	**1200 MW**	**1680 MW**
	III	**Vertical Pressure Shaft**		
	a	Type		Steel lined — circular
	b	Number of Pressure Shafts		7 Nos.
	c	Diameter of shaft		7.5 m dia.
	d	Length of Vertical Shaft		84.30 m each (up to start of Horizontal Shaft)
	e	Thickness of Steel Liner		25 mm to 34 mm
	f	Grade of Steel Plate		ASTM A 517 Gr.F
	IV	**Bottom Horizontal Pressure Shaft**		
	a	Type		Steel lined — circular
	b	Number of Pressure Shafts		7 Nos, wherein 1 No Independent Pressure shaft bifurcated into 2 for smaller units
	c	Diameter of main pressure shaft		7.5 m
	d	Discharge in Main Pressure shaft		230.80 Cumec each for units- 7 & 8 226.41 Cumec each for units- 1 to 6
	e	Velocity in Main Pressure shaft		5.22 m/sec for unit 7 & 8 5.12 m/sec for unit 1 to 6
	f	Diameter of branch Pressure shaft		5.3 m
	g	Discharge in Branch Pressure shaft		115.40 m^3/s
	h	Velocity in Branch Pressure shaft		5.33 m/s

S.No		Description	Existing Salient Features	Now Proposed
		Installed Capacity of Project	**1200 MW**	**1680 MW**
	i	Length of Bottom Horizontal Pressure Shaft		114.06 m (for Units-7 & 8) 155.20 m each (for Unit-1 to 6)
	j	Length of Bottom Horizontal branch Pressure Shaft		62.23 m (for Unit-7 & 8)
	k	Thickness of Steel Liner (7.5m Dia)		34 mm to 38 mm
	l	Thickness of Steel Liner (5.3m Dia)		26 *mm to 34 mm*
	m	Grade of Steel Plate		ASTM 517 GRADE-F
11		**Main Inlet Valve (MIV)**		
	a	Size of MIV		5.30 m Diameter (for larger unit) 3.80 m diameter (for smaller unit)
12		**Adit Tunnels**		
	a	Adit to Penstock Bottom		838.0 m long 9.0m dia. D Shaped Tunnel
	b	Escape Tunnel from Machine Hall		129.0 m long 6.5m dia. D Shaped Tunnel
13		**Powerhouse**		
	a	Type	Surface Powerhouse	Surface Powerhouse
	b	Center Line of Unit		El. 290.00 m
	c	Dimensions	L 240.00m x B 24.00 m x H 58.00 m	215.00 m (L) x 25.5 m (W) x 58.00 m (H)
	d	Size of Service bays		36 m (L) x 25.5 m (W)
	e	Service bay level		El. 303.50 m
	f	Crane Beam Level in Po		El. 316.80 m

S.No		Description	Existing Salient Features	Now Proposed
		Installed Capacity of Project	**1200 MW**	**1680 MW**
		werhouse		
	g	Size of Unloading Bay		44.70 m (L) X 20.0 m (W)
	h	Unloading Bay Level		El. 328.30 m
	i	Unit Installed Capacity		6x240 MW + 2X120 MW
	i	Unit Design Discarge		
	a	Generation mode		226.41 Cumecs & 115.40 Cumecs for 240 MW & 120 MW respectively
	b	Pump mode		189.60 Cumecs & 90.20Cumecs for 240 MW & 120 MW respectively
	ii	Net Head/Rated Head		
	a	Generation mode		121.43 m & 120.13 m for 240 MW & 120 MW respectively
	b	Pump mode		128.23 m & 128.63 m for 240 MW & 120 MW respectively
	iii	Head Loss (all units/one unit)		
	a	Generation mode		3.60 m & 4.90 m for 240 MW & 120 MW respectively
	b	Pump mode		3.20 m & 3.60 m for 240 MW & 120 MW respectively
	c	TWL for Rated Power		330.67 m
	d	Minimum TWL		321.80 m

S.No		Description	Existing Salient Features	Now Proposed
		Installed Capacity of Project	**1200 MW**	**1680 MW**
	e	Maximum TWL		335.10 m
14		**Tait Race Tunnel**		
	a	Type		Concrete Lined — Circular
	b	Number of Tunnel		8 Nos (6 individual tunnels for Larger units & 2 individual tunnels for Smaller units)
	c	Diameter for Larger Unit		8.7 m each
	d	Length for Larger Unit		145.50 m each
	e	Design Discharge in tunnel for larger unit		226.41 m^3/s
	f	Velocity in tunnel for larger unit		3.81 m/s
	g	Diameter for Smaller Unit		6.8 m each
	h	Length for Smaller Unit		160.43 m each
	Î	Design Discharge in tunnel for smaller unit		115.40 m^3/s
	j	Velocity in tunnel for smaller unit		3.18 m/s
15		**Tailrace Outlet Structure**		
	a	Type	Open Semi Circular	Diffuser Type
	b	Number of Outlet		8 Nos. (6 Nos. for Larger units & 2 nos. for Smaller units)
	c	Size of Each Outlet		23 m (W) x 10.5 m (H) for Larger Units 19.00 m (W) x 6.50 m (H) for Smaller Units

S.No		Description	Existing Salient Features	Now Proposed
		Installed Capacity of Project	**1200 MW**	**1680 MW**
	d	Elevation of outlet centre line	EL + 305.70 m	EL +307. 92 m for Larger units EL +306.97 m for Smaller units
	e	Elevation of outlet bottom		EL +303.57 m
	f	Trash rack type		Vertical with inclination of 15°
	g	Size of Trash Rack		3 no's of 6.67m(W) x 10.87m(H) for each larger unit 3 no's of 5.33m(W) x 7.25m(H) for each smaller unit
	h	Velocity through Trash rack		1.03 m/s
	i	Tail Race outlet Service Gate		6 Nos. - 6.85 m (W) x 8.7 m (H) for Larger Units & 2 Nos. - 5.35 m (W) x 6.8 m (H) for Smaller Units with Independent Hydraulic Hoist
	j	Tail Race outlet Stoplog Gate		1 set — 6.85 m (W) x 8.7 m (H) for Larger Units & 1 set — 5.35 m (W) x 6.8 m (H) for Smaller Units with Common Movable Gantry Crane
16		**Tail Race Channel**		
	a	Type of Channel	Trapezoidal Channel - Lined	Concrete Lined with Trapezoidal Shape
	b	Lenth of the channel	1300 m	1614.11 m
	c	Bed Width	70 m	20.88 m
	d	Full supply depth	6.00 m	12.80 m

S.No		Description	Existing Salient Features	Now Proposed
		Installed Capacity of Project	**1200 MW**	**1680 MW**
	e	Bed slope	1 in 5000	1 in 1614.11
	f	Side Slope of the Channel		1V:1.6H
	g	Design Discharge		1589.26 Cumec
17		**Hydro- Mechanical Equipment**		
	a	**Intake Structure**		
		Trash Rack		
	i	No of bays in each trash rack	6 Nos – 21.0m high	8 Nos.- 10.5 m high each (6 no. large units) & 6.5 m high each (for 2 no. large units)
	ii	Intake Service Gate - 6 Nos	W5.77 m X H7.00 m (Vertical lift fixed wheel)	6 Nos.- 6.85 m (W) x 8.7 m (H) for Larger Units &2 Nos. - 5.35 m (W) x 6.8 m (H) for Smaller Units with Independent Hydraulic Hoist
	iii	Intake Stop log Gate - 6 Nos	W5.77 m X H7.00 m (Vertical lift fixed wheel)	1 set – 6.85 m (W) x 8.7 m (H) for Larger Units & 1 set – 5.35 m (W) x 6.8 m (H) for Smaller Units with Common Movable Gantry Crane
	b	**Draft Tube Gates**	High pressure steel type slide gates	-
	i	No. of gates per unit	2 per unit - W 6.5 m X H 7.0 m (Vertical lift fixed wheel type)	-
	c	**Tailrace Outlet Structure**		
	i	No. of bays in each trash rack	6 Nos – 18.0m high	3 no’s of 6.67m(W) x 10.87m(H) for each larger unit 3 no’s of 5.33m(W) x 7.25m(H) for each smal

S.No		Description	Existing Salient Features	Now Proposed
		Installed Capacity of Project	**1200 MW**	**1680 MW**
				ler unit
18		**Electro-Mechanical Equipment**		
	a	Pump Turbine	Francis type, vertical shaft reversible pump-turbine	Unchanged
	b	Total No of units	7 no’s (5 X 200MW & 2 X 100 MW)	8 no’s (6 X 240MW & 2 X 120 MW)
	c	Total Design Discharge (Turbine Mode)	1162.85 Cumec	1589.26 cumec
	d	Rated Head in Turbine mode	119.27m	121.43 m
	e	Centre Line of Units		EL +290.00 m
	18.1	**Turbines**	**200MW**	**240 MW**
	i	Total No of units	5 Units (2 Nos with Variable speed & 3 Nos with Fixed Speed)	6 Units (All units are Fixed speed)
	ii	Turbine Capacity	200MW	240 MW
	iii	Turbine Design Discharge	193.81 Cumec for each unit	226.416 m3/s for each Unit
	iv	Rated Head in Turbine Mode		121.43 m
	v	Pump Capacity	244 MW	257 MW
	vi	Rated Pumping Head	125.77 m	128.23 m
	vii	Rated Pump Discharge	178.42 Cumecs	189.60 cumec
	viii	Synchronous speed	136.36 rpm	187.50 rpm
	18.2	**Generator- Motor**		
	a	Type	03 phase, alternating current synchronous, generator motor semi umbrella type with vertical shaft	Unchanged

S.No		Description	Existing Salient Features	Now Proposed
		Installed Capacity of Project	**1200 MW**	**1680 MW**
	b	Number of units	5 Units	6 Units
	c	Rated Capacity	Generator – 200 MW;	Generator – 240 MW
			Pump Input – 244 MW	Pump Input – 257 MW
	d	Rated Voltage	18.0 KV	Unchanged
	18.3	**Main Power Transformer**		
	a	Type	Indoor, 3-Ph transformers with Off-Circuit tap changer (OCTC)	Outdoor Three-Phase Power transformers with On Load tap changer
	b	Number of units	5 Units	6+1(spare) Units
	c	Rated Capacity of each unit	280 MVA	300 MVA
	d	Rated Voltage	Primary – 18.0 kV; Secondary - 400 kV adjustable range of the secondary voltage: -10% to + 10% (3kV/tap)	Primary- 18 KV; Secondary- 400 kV adjustable range of the secondary voltage: -10% to +10% in 1.25% steps
	18.4	**Turbines**	**100MW**	**120 MW**
	a	Total No of units	2 Units (1 Nos with Variable speed & 1 Nos with Fixed Speed)	2 Units (both are Fixed speed)
	b	Turbine Capacity	100MW	120 MW
	c	Turbine Design Discharge	96.90 m^3/s for each unit	115.40 m^3/s for each Unit
	d	Pump Capacity	130 MW	123 MW
	e	Rated Head in Turbine mode	125.77 m	120.13 m
	f	Rated Head in Pump Mode		128.63 m
	g	Rated Pump Discharge	94.37 Cumec for each unit	90.20 cumec

S.No		Description	Existing Salient Features	Now Proposed
		Installed Capacity of Project	**1200 MW**	**1680 MW**
	h	Synchronous speed	187.5 rpm	272.727 rpm
	18.5	**Generator- Motor**		
	a	Type	Three (3) phase, alternating current synchronous, generator motor semi umbrella type with vertical shaft	Unchanged
	b	Number of units	2 Units	Unchanged
	c	Rated Capacity	Generator – 100 MW; Pump Input – 130 MW	Generator – 120 MW Pump Input – 123 MW
	d	Rated Voltage	18.0 kV	Unchanged
	18.6	**Main Power Transformer**		
	a	Type	Indoor, 3-Ph transformers with Off-Circuit tap changer (OCTC)	Indoor, 3-Ph transformers with On Load Tap Changer
	b	Number of units	2 Units	Unchanged
	c	Rated Capacity of each unit	150 MVA	
	d	Rated Voltage	Primary- 18 kV; Secondary- 400 kV adjustable range of the secondary voltage: -10% to + 10% (3kV/ tap)	Primary- 18 KV; Secondary – 400 kV adjustable range of the secondary voltage: -10% to +10% in 1.25% steps
19		**420KV Gas Insulated Switchgear (GIS)**		
	a	Type of GIS	Indoor Type	Unchanged
	b	No. of GIS units	One No.	
	c	Location	Inside GIS Building above ground	
	d	Scheme	Double Busbar Arrangement with bus sectionalize	
		POWER EVACUATION		

S.No		Description	Existing Salient Features	Now Proposed
		Installed Capacity of Project	**1200 MW**	**1680 MW**
20	a	Voltage Level (KV)	400 KV	400 KV
	b	No. of Transmission lines	02 Nos for each connecting point	01 Double Circuit Transmission Line
	c	Conductor	Moose	Quad Moose
	d	Total Length	Line 2: 20 Kms to PGCIL 765/ 400 KV SS near Orvakallu 6 Km up to Central Pooling Substation of IREP	Central Pooling Substation (CPSS) 6 Km up to Central Pooling Substation of IREP
21		**Estimated Cost**		
	a	Civil Works & Other works	2684.76 Cr.	5470.44 Cr
	b	E & M Works incl transmission	2263.68 Cr.	2493.57 Cr
	c	IDC	519.58 Cr.	1559.00 Cr
		Total Project Cost with IDC	**5468.02 Cr.**	**9523.01 Cr**

3.2.3. Deliberations by the committee in previous meetings

N/A

3.2.4. Deliberations by the EAC in current meetings

The EAC during deliberations noted the following:

The Expert Appraisal Committee (EAC) deliberated on the information submitted, as well as the presentation made during the meeting. It was observed that the proposal pertains to the request for an amendment to the Environmental Clearance for the Pinnapuram Integrated RESP-Storage Project (1200 MW) located in the sub-districts of Gadivemula, Orvakal, Panyam, in the districts of Nandyal and Kurnool, Andhra Pradesh, submitted by M/s Greenko AP01 IREP Private Limited.

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

The EAC observed that the proposal submitted by the PP is for amendment in Environmental Clearance granted by the Ministry on 14.07.2020 for construction of Pinnapuram Integrated RESP-Storage project (1200 MW) in Tehsil Nandyal, District Kurnool, Andhra Pradesh by M/s Greenko Energies Private Limited. Subsequently, transfer of EC from M/s Greenko Energies Private Limited to M/s Greenko AP01 IREP Private Limited accorded by the Ministry on 13.02.2023.

The EAC noted that the following are the reasons for seeking amendment in EC:
During the deliberation the EAC noted that major changes from earlier EC has been proposed by the PP such as modification in capacity from 1200 MW to 1680 MW without changing any location of the project, water requirement from 1.2 TMC to 1.30 TMC, increase in dimensions of dam of both lower and upper reservoir and land requirement for the project has been increased from 713.65 Ha to 785.58 Ha in which forest land has been increased from 365.66Ha to 415.83 Ha, Private land increased from 119.65Ha to 192.02 Ha and Government land has been deceased from 228.34Ha to 177.73Ha. Further, the EAC noted that Stage- I Forest Clearance for diversion of 365.66 Ha of forest land accorded by Ministry on 23/04/2020 and Stage II was issued on 24/05/2021 (for 46.64 ha) and on 24/05/2022 and corrected on 30/05/2022 (for 319.02 Ha).
The application for diversion of 50.17 ha of additional forest land is filed vide FP/AP/HYD/IRRIG/462719/2024 dated 15/02/2024. It was further noted that as per provisions in RFCTLARR, 2013; private land is purchased by direct negotiation and total private land of 192.02 ha, belonged to 244 land owners and process of acquiring and purchasing of entire private land is completed.
The EAC noted that PP has submitted additional EIA/EMP report with fresh baseline data collected during November 2024- December 2024. It has been noted that as per document, the ambient air quality monitoring done in the study area, the baseline concentration of Particulate Matters (PM10 & PM2.5), SOx and NOx as compared to the baseline data collected previously for EIA report were slightly increased near the sites located around various components of Pinnapuram IRESP Storage Project. However, the concentration of Particulate Matters (PM10 & PM2.5), SOx and NOx were found below the permissible limits as prescribed by CPCB.
The EAC noted that as per EIA analysis of Surface water samples shows no significant changes due to the construction activities in the area. Water Quality of most of the surface water samples were found under Class 'D' (i.e., water only suitable for Propagation of Wildlife and Fisheries) according to Water Quality Criteria of Central Pollution Control Board. As compared to baseline data collected previously, no significant changes were observed in surface water quality of the area. According to WQI values obtained for different locations, in general, is in the 'Medium' category except at site SW3, Pond located near Pinnapuram village where the water quality was found under Bad category.
During the meeting, the EAC inquired about revised EMP budget, Time bound action plan to stabilize Muck disposal sites, agreement and sale deeds of newly added landowners for the private land in upper reservoir, Conservation Program of Great Indian Bustard being carried out at Rollapadu Wildlife Sanctuary, CEA approvals as per revised capacity of 1680 MW. The PP vide email dated 28.04.2025 submitted the desired information sought by the EAC and found satisfactory. The EMP budget has been at time of grant of EC was 11839.55 Lakhs whereas PP has spent 15637.31 Lakhs till date and additional 1826 lakhs has been proposed.
The Committee noted that the Public hearing was carried out in District kurnool on 02.11.2018 under the chairmanship of the collector and district Magistrate, kurnool and compliance of the commitments made by the PP during the Public hearing was found satisfactory. The EAC noted that the project location falls under two district as information submitted by the PP on Parivesh Portal whereas public hearing has been conducted in only one district i.e. Kurnool. The PP informed that there is no change in location of the project. At the time of EC in 2020, entire project was in Kurnool district. Public Hearing meeting was held on 02/11/2018 near Mandal Parishad Upper Primary School, Pinnapuram, Panyam Mandal, Kurnool District, Andhra Pradesh. During the process of re-organization of districts of Andhra Pradesh, a new Nandyal district was carved out of Kurnool district as per G.O. Ms. No. 192, Revenue (Lands-IV), dated 04/04/2022.
The EAC observed that the proposal qualifies the criteria to be considered under the prvisions of the Para 7 (ii) of the EIA Notification, 2006, as amended. It was also observed that in view of compliance of the commitments made by the PP during the Public hearing and land acquisition status there is no need for repeat public hearing.
The EAC observed that Certified Compliance Report has been submitted by IRO on 06/11/2024 wherein most of the EC conditions as complied/Being Complied. Some conditions are partly complied and one not complied condition is related to Multi-Disciplinary Committee (MDC) has not been constituted. Therefore, it was advised that PP shall submit a time bound action plan for ensuring the compliance of partly complied points within 15 days alongwith a proposal for formation of MDC to the Ministry.
The EAC appreciated trees translocation technique used by the PP as their survival rate is more than 80%.

27.2.4 The EAC after detailed deliberation on the information submitted and as presented during the meeting, **recommended** the proposal for grant of amendment in Environmental Clearance dated 14.07.2020 for Pinnapuram Integrated RESP-Storage project (1200 MW to 1680 MW) in Sub District Gadivemula, Orvakal, Panyam, District Nandyal and Kurnool, Andhra Pradesh by M/s Greenko AP01 IREP Private Limited., under the provisions of EIA Notification, 2006, as amended subject to the standard EC conditions along with following specific conditions:

3.2.5. Recommendation of EAC

Recommended

3.2.6. Details of Environment Conditions

3.2.6.1. Specific

Specific Conditions	
1.	All the conditions mentioned in the EC letter dated 14.07.2020 and subsequent EC transfer dated 13.02.2023 shall remain unchanged
2.	Stage-I Forest Clearance for 50.17 ha of additional forest land involved shall be submitted before grant of prior Environmental Clearance.
3.	As the total project cost has been increased, the Environmental Management Plan (EMP) budget shall be revised proportionally i.e @ 2.16% of current project cost, in each component of EMP. A time bound action plan for implementation of revised EMP shall be submitted to regional office, MoEF&CC

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	Absent
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	
7	Shri Ajay Kumar Lal	Member (EAC)	akl****@gmail.com	
8	Dr A K Sahoo	Member (EAC)	ami***@gmail.com	Absent

9	Shri Balram Kumar	Member	emo***@nic.in	
10	Shri Rajeev Varshney	Member	rva**********@gov.in	
11	Yogendra Pal Singh	Scientist - F	yog*******@nic.in	

MINUTES OF THE 27TH MEETING (PHYSICAL) OF THE EXPERT APPRAISAL COMMITTEE FOR RIVER VALLEY AND HYDROELECTRIC PROJECTS HELD ON 27TH MARCH, 2025

The 27th meeting of the EAC for River Valley & Hydro-electric Projects was held on 27th March, 2025, under the Chairmanship of Prof. G. J. Chakrapani in the Ministry of Environment, Forest and Climate Change, Indira Paryavaran Bhawan, Jor Bagh Road, New Delhi. The list of Members present in the meeting is at **Annexure**.

Confirmation of the Minutes of the 26th EAC meeting:

The Minutes of the Meeting held on 24th EAC meeting on 14thMarch, 2025 were confirmed.

Agenda Item No. 27.1

Kotpali Close loop Pumped Storage Hydro-electric Project (1800 MW) in an area of 357 Ha located at Village Joka, Pendirdih and Samri Protected Forest, Sub District Shankargarh, District Balrampur, Chhattisgarh by M/s Chhattisgarh State Power Generation Company Limited – Terms of Reference (TOR) - reg.

[Proposal No. IA/CG/RIV/520918/2025; F. No. J-12011/11/2025-IA.I (R)]

27.1.1 The proposal is for grant of Terms of References (ToR) to the project for Kotpali Close loop Pumped Storage Hydro-electric Project (1800 MW) in an area of 357 Ha located at Village Joka, Pendirdih and Samri Protected Forest, Sub District Shankargarh, District Balrampur, Chhattisgarh by M/s Chhattisgarh State Power Generation Company Limited.

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

i. The proposed Kotpali Pumped Storage Hydro-electric Project (1800 MW) envisages utilization of available head between proposed upper dam and lower dam. An Underground Power House (UGPH) will be located in between two reservoirs. Both the reservoirs will be interconnected through water conductor system and the generator and turbines installed at the power house.

ii. The proposed Kotpali Pumped Storage Project of lower reservoir and upper reservoir is located near village Rakhia and Tuthdipa of Jokhapat Panchayat, Tehsil Shankarghad, District Balrampur which is situated the northern part of Chhattisgarh. The project falls in 23°21'12.35"N, 83°38'46.75"E (Lower Reservoir) and 23°23'9.32"N, 83°39'23.11"E (Upper reservoir).

iii. The Kotpalli pumped storage project (PSP) is an off-stream closed-loop pumped storage scheme. In off-stream closed loop stream none of the reservoirs is located on any river/stream/nallah. Kanhar river passes by the Kotpalli pumped storage project.

iv. **Land requirement:** The total land to be acquired for the project is approximately 357 hectares. Based on the site visit and preliminary secondary data available, most of the land required is coming under private as well as forest.

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

- **Population:** As of 2011, the population of Balrampur district was 7,30,491. The population density is 100 people per square Kilometer.

- Sex ratio: The sex ratio in Balrampur was 973 females per 1000 males.
- Literacy rate: The literacy rate in Balrampur district is 57.98%.

- Urban vs rural: 4.75% of the population lives in urban areas, and 95.25% live in rural areas.

- Scheduled Castes and Scheduled Tribes: Scheduled Castes and Scheduled Tribes made up 4.48% and 62.83% of the population respectively.

vi. **Water requirement:** There is an additional requirement of 1.75 MCM annually apart from one time filling water requirements of 15.51 MCM will be met from the Kanhar River.

vii. **Project Cost:** The cost of Project is Rs. 7550.82 Crores at PFR Stage.

viii. **Project Benefit:** The scheme would afford on annual peaking period energy generation of 3958.75 GWh annually considering the project operation for one cycle for 6 hours 1.53 minutes peaking per day with design energy generation of 3760.82 GWh, calculated with 95% capacity availability. However, project can also generate 5938.13 GWh annually considering the project operation for one and half cycle for 9 hours 2.29 minutes peaking per day with design energy generation of 5641.22 GWh, calculated with 95% capacity availability.

ix. **Environmental Sensitive area:** There are "NO" national parks, wildlife sanctuaries, Biosphere Reserves, Tiger/Elephant Reserves, Wildlife Corridors etc. within 10 km distance from the project site. River/ water body Kanhar River is flowing at a distance (Arial) of 06 Km in North direction.

x. **Resettlement and rehabilitation:**

In Kotpali site approx. 70 - 75 households are affected in the project area as per the preliminary study and the details are as below.

1. U/R – 65-70 Households
2. HRT Intake – 3-5 Households

xi. **Status of Litigation Pending against the proposal, if any.**

xii. The salient features of the project are as under**:**

1. **Project Details**:

Name of the Proposal	Kotpali Off-Stream Close Loop Pumped Storage Hydro-electric Project (1800 MW)
Location (Including coordinates)	Village Joka, Pendirdih and Samri Protected Forest, Sub District Shankargarh, District Balrampur, Chhattisgarh. The upper reservoir falls in 23°23'9.32"N & 83°39'23.11"E and Lower Reservoir falls in 23°21'12.35"N & 83°38'46.75"E respectively.
Inter- state issue involved	No
Seismic zone	Zone-II

2. **Category Details:**

Category of the project	A
Provisions	-
Capacity / Cultural command area (CCA)	1800 MW
Attracts the General Conditions (Yes/No)	No
Additional information (if any)	-

3. **Electricity generation capacity:**

Powerhouse Installed Capacity	6 units of 300 MW each
Generation of Electricity Annually	3958.75 GWh for 1 cycle operation 5938.13 GWh for 1.5 cycle operation
No. of Units	6
Additional information (if any)	-

4. **ToR/EC Details:**

Cost of project	Rs. 7550.82 Crores
Total area of Project	357 Hectares
(Height of Dam from River Bed Level (EL))	Upper dam-23m Lower dam–55 m (Saddle dam–25 m)
Length of Tunnel/Channel	3390 m
Details of Submergence area	Non-Forest Land – 42 Hectare Forest Land – 145 Hectare
Types of Waste and quantity of generation during construction/ Operation	Sewage generated from Labour camps 400 KLD per day.
E-Flows for the Project	It is a pumped storage project; E flows will be governed from the proposed Lower dam.
Is Projects earlier studies in Cumulative Impact assessment & Carrying Capacity studies (CIA&CC) for River in which project located. If yes, then a) E-flow with TOR /Recommendation by EAC as per CIA&CC study of River Basin. b) If not the E-Flows maintain criteria for sustaining river ecosystem.	NA

5. **Muck Management Details:**

No. of proposed disposal area/ (type of land- Forest/ Pvt. land)	25 hectares (approx.) non-forest land
Muck Management Plan	Shall be taken up as part of DPR
Monitoring mechanism for Muck Disposal	Shall be taken up as part of DPR

6. **Land Area Breakup:**

Private land	169 Hectares (Non Forest land)
Government land/Forest Land	188 Hectares (Forest Land)

Submergence area/Reservoir area	187 Hectares
Land required for project components	277 Hectares
Additional information (if any)	-

7. **Presence of Environmentally Sensitive areas in the study area:**

Forest Land/ Protected Area/ Environmental Sensitivity Zone	Yes/No	Details of Certificate/letter/Remarks
Reserve Forest/Protected Forest Land	(Yes)	**Total Forest Land – 188 Ha** *(Protected Forest Land – **188 Ha**)*
National Park	No	
Wildlife Sanctuary	No	

8. **Court Case Details**: Nil

9. **Previous EC compliance and necessary approvals:**

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

10. **Miscellaneous:**

Particulars	**Details**
Details of consultant	M/s WAPCOS Limited
Project Benefits	Hydro-electric power and Employment generation
Status of other statutory clearances	-
R&R details	Total 70-75 Households (U/R – 65-70 Households HRT Intake – 3-5 Households)
Additional detail (If any)	-

27.1.3 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 to the project for conducting EIA/EMP and Public hearing for Kotpali Close loop Pumped Storage Hydro-electric Project (1800 MW) in an area of 357 Ha located at Village Joka, Pendirdih and Samri Protected Forest, Sub District Shankargarh, District Balrampur, Chhattisgarh by M/s Chhattisgarh State Power Generation Company Limited.

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

The EAC noted that the total land required for the proposed project is estimated to be 357 hectares (ha), comprising 169 ha of non-forest land and 188 ha of forest land. 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 Project Proponent indicated that there are no national parks, wildlife sanctuaries, Biosphere Reserves, Tiger/Elephant Reserves, or Wildlife Corridors within a 10 km radius of the project site. However, it was noted that the Semarsot Wildlife Sanctuary is located 10.5 km from the proposed project boundary. Additionally, the committee observed that the land requirement for road construction is 35 hectares, primarily due to the construction of wide roads, which could potentially be optimized.

The EAC further noted that the total water requirement for the project is 1.75 MCM annually, in addition to a one-time filling water requirement of 15.51 MCM, which will be sourced from the Kanhar River. The EAC expressed concerns regarding the water allocation for the project, as it was observed that several other projects are already planned downstream of the proposed site. As a result, the EAC advised that any interstate issues, water availability, and water-sharing matters should be resolved with the competent authorities before proceeding with the proposal. Furthermore, the Project Proponent was instructed by the EAC to conduct a detailed study on water utilization by downstream users and its potential impact on the river survival and region's ecosystem. To ensure long-term sustainability, the EAC recommended that a comprehensive Water Utilization Mapping be carried out within a 10 km radius of the project site. This study should include:

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

During its deliberations, the EAC observed that the lower reservoir for the project is planned to be filled by creating a storage on a tributary of the Kanhar River, through the construction of a weir and the installation of a pipe system to connect the weir to the proposed Lower Dam. The EAC noted that, as informed by the Project Proponent, the lower reservoir is located on the tributary of the Kanhar River. Accordingly, the the project should be classified as an Open Loop project, rather than a Closed Loop project.

Additionally, the EAC raised serious concern over the construction of weir for one time filling of the reservoir which will be carried out in two monsoon season, afterwards weir will of no use and eventually it will effect downstream users, so it was stated that there shall no need for diverting the flow of the river. Therefore, it was advised to change the layout for connecting a pipe system to fill water in the reservoir.

27.1.4 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 Open Loop Pumped Storage Projects vide OM dated 14.08.2023 for conducting EIA study for proposed construction of the project for Kotpali Open loop Pumped Storage Hydro-electric Project (1800 MW) in an area of 357 Ha located at Village Joka, Pendirdih and Samri Protected Forest, Sub District Shankargarh, District Balrampur, Chhattisgarh by M/s Chhattisgarh State Power Generation Company Limited, under the provisions of EIA Notification, 2006, as amended along with the following additional/specific ToR:

[A] Environmental Management and Biodiversity Conservation:

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

ii. Action plan for survival or diversion of the rivulets/stream, if any, leading to join Reservoir and Kanhar River shall be submitted.

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

iv. PP shall carried out detail study on number of Sal tress available in the study area and number of them that will be felled for the conduction of the project.

v. Explore the possibilities for reducing the Forest land requirement. The application for obtaining Stage I FC for 188 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. PP shall submit the detailed plan for filling the reservoir from the Bahula reservoir Kanhar River along with necessary approval form water resource department. Necessary clearance/ approval for interstate issues/ water availability/water sharing issues shall be obtained.

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

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

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

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

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

xiv. 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.

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

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

xvii. 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.

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

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

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

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

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

[B] Socio-economic Study

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

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

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

iv. Land acquired for the project shall be suitably compensated in accordance with the law of the land with the prevailing guidelines. Private land (if any) shall be acquired as per provisions of Right to Fair Compensation and Transparency in Land Acquisition,

Rehabilitation and Resettlement Act, 2013. Budget earmarked for R&R, CSR shall not be included in the cost of EMP.

[C] Muck Management

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

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

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

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

[D] Disaster Management

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

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

[E] Miscellaneous

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

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

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

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

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

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

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

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

Agenda Item No. 27.2

Pinnapuram Integrated RESP-Storage project (1200 MW) in Sub District Gadivemula, Orvakal, Panyam, District Nandyal and Kurnool, Andhra Pradesh by M/s Greenko AP01 IREP Private Limited - Amendment in Environmental Clearance – reg

[Proposal No. IA/AP/RIV/530047/2025; F. No. J-12011/12/2018-IA.I (R)]

27.2.1 : The proposal is for grant of amendment in Environmental Clearance to Pinnapuram Integrated RESP-Storage project (1200 MW) in Sub District Gadivemula, Orvakal, Panyam, District Nandyal and Kurnool, Andhra Pradesh by M/s Greenko AP01 IREP Private Limited.

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

i. The proposal is for amendment in the Environmental Clearance granted by the Ministry Vide letter dated 14.07.2020 for the project Pinnapuram Integrated RESP-Storage Project located at in village Pinnapuram, Brahmanapalle & Gutum Thanda, Tehsil Panyam & Orvkal, District Nandyal & Kurnool, Andhra Pradesh in favour of M/s Greenko AP01 IREP Private Limited (Previously Greenko Energies Private Limited).

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

S. No.	Para of EC issued by MoEF&CC	Details as per the EC	To be revised/ read as	Justification/ reasons
1	Subject	Pinnapuram Integrated RESP-Storage (1200 MW) in Tehsil Nandyal, District Kurnool, Andhra Pradesh by M/s Greenko Energies Private Limited	Pinnapuram Integrated RESP-Storage (1680 MW) in Tehsil Panyam in District Nandyal and Tehsils Panyam and Gadvemula in District Kurnool, Andhra Pradesh by M/s Greenko AP01 IREP Private Limited	Transfer of EC in the name of M/s Greenko AP01 IREP Private Limited and Capacity Enhancement. As per the latest topographical survey the reservoir levels have been optimized corresponding to the required storage capacities without changing the location
2	Point No. 3	storage capacity of 1200 MW/9600 MWH for 08 hours.	storage capacity of 1680 MW/9304.40 MWH for 5.54 hours.	As per the latest topographical survey the reservoir levels have been optimized corresponding to the required storage capacities without changing the location
3	Point No. 5	1.2 TMC for facilitating 8 hour storage capacity.	1.30 TMC for facilitating 5.54 hour storage capacity.	Without changing the project reservoir shape and levels the storage capacity reworked out to 1.30 TMC. The same shall be used for recirculation for generation & pumping vice versa as non-consumptive reutilization.
4	Point No. 5	The FRL and gross storage capacity of Upper Reservoir are EL +463.00M and 1.37 TMC	The FRL and gross storage capacity of Upper Reservoir are EL +460.80M and 1.697 TMC	As per the latest topographical survey the reservoir levels have been optimized corresponding to the required storage capacities without

S. No.	Para of EC issued by MoEF&CC	Details as per the EC	To be revised/ read as	Justification/ reasons
				changing the location.
5	Point No. 5	The FRL and gross storage capacity of Lower Reservoir are EL +340.00M and 1.42 TMC	The FRL and gross storage capacity of Lower Reservoir are EL +335.10M and 1.55 TMC	As per the latest topographical survey the reservoir levels have been optimized corresponding to the required storage capacities without changing the location.
6	Point No. 5	The scheme envisages construction of rock fill embankment of average height around 12m to 14m and with maximum height of 35m in Upper Reservoir & 33m in Lower Reservoir for short reach	The scheme envisages construction of Rock Fill Embankment dam with PVC Geo Membrane Facing (GFRD of average height around 12m to 14m and with maximum height of 40m in Upper Reservoir & 38 m in Lower reservoir for short reach	The type of dam changed to PVC Geomembrane Faced Rockfill Dam (GFRD) from the earlier proposed rockfill dam due to shorter construction period, less maintenance, easy connection to concrete surface, higher placing rate and resistance against wind uplift and the high drawdown rate of reservoir. In both the dams, the fill material is the rockfill and hence there is no change in the material type.
7	Point No. 5	45m High RCC Intake structure	41.80 m (covered with RCC slab at top up to Intake Gate)	Due to reconfiguration
8	Point No. 5	6 nos. of 760 m long and 7.0m dia. inclined circular steel lined Penstock / Pressure Shaft five each for each unit of 200 MW and one bifurcated into 2 penstocks to feed 2	7 nos. of 652.91 m long and 7.5m dia. inclined circular steel lined Penstock / Pressure Shaft six each for each unit of 240 MW and one bifurcated into 2 penstocks to feed 2	The project capacity has been enhanced to 1680 MW by adding one more unit. which requires additional Penstock/pressure shaft. Thus, the total no of penstock/pressure

S. No.	Para of EC issued by MoEF&CC	Details as per the EC	To be revised/ read as	Justification/ reasons
		units of 100 MW.	units of 120 MW.	shaft are 7
9	Point No. 5	A surface Power house having an installation of 5 each of 200 MW capacity and 2 each of 100 MW capacity; operating under a rated head of 119.27 m in generating mode and 125.77 m in pumping mode.	A surface Power house having an installation of 6 each of 240 MW capacity and 2 each of 120 MW capacity; operating under a rated head of 120.13 m in generating mode & 128.63 m in pumping mode.	Enhancement of installed capacity from 1200 MW to 1680 MW requires installation of one additional pump turbines i.e. number of total units has increased from 7 to 8.
10	Point No. 5	70m wide concrete lined Tail race channel with FSD of 6.00m and 1300 m long connecting Tail race channel to the lower reservoir.	20.88 m wide (Finished bed width) Concrete Lined tail race channel with FSD of 12.80 m and 1614.11 m long connecting Tail race tunnel to the lower reservoir.	Due to reconfiguration.
11	Point No. 6	Land requirement of 713.65 Ha in which 365.66Ha of forest land, 119.65Ha Private land and 228.34Ha of Government land.	Land requirement of 785.58 Ha in which 415.83 Ha of forest land, 192.02 Ha Private land and 177.73Ha of Government land.	Due to change in realignment and reconfiguration.
12	Point No. 6	MOEFCC has issued in-principal approval for diversion of 365.66 ha forestland	365.66 ha forest land has been approved by MOEFCC and proposal for diversion of an additional 50.17 ha forest land is filed vide FP/AP/HYD/IRRIG/462719/2024 dated 02.03.2025	Due to change in alinement and reconfiguration.
13	Point No. 6	Total Cost of Project is about Rs.5468.03 Crores	Total Cost of Project is about Rs.9523.01 Crores	The cost of the project has been increased due reconfiguration.

iii. Detail reason for amendment in EC:

Pinnapuram Integrated RESP-Storage project with 1200 MW installed capacity was accorded environment clearance on 14/07/2020. The project was designed for 8.0 hours of peak generation duration with 1200 MW installed capacity to create a storage capacity of 9600 MWH. As per the power grid requirement, PSPs should be designed for about 6 hours peak supply on daily basis. During detailed engineering and optimization exercise, project installed capacity was revised to 1680 MW with corresponding changes in project parameters. The project operation duration has been optimized to 5.54 hours daily. Keeping the storage capacity close to earlier designed value, the installed capacity is revised to 1680 MW, which will give a storage capacity of 9304.40 MWH. Additional 71.93 ha of land (50.17 ha forest land and 72.37 ha private land including reduction in government land by 50.61 ha) is involved for the amendment proposal

During detailed engineering design, keeping in view the further geological investigation, layout has been optimized to achieve 1680 MW installed capacity.

iv. The comparative statement with reference to earlier proposal and revised proposal is as under:

S.No		Description	Existing Salient Features	Now Proposed
		Installed Capacity of Project	**1200 MW**	**1680 MW**
1		**NAME OF THE PROJECT**	Pinnapuram Integrated RESP – Storage Project (1200 MW)	Pinnapuram Integrated RESP – Storage Project (1680 MW)
2		**Location**		
	a	Country	India	Unchanged
	b	State	Andhra Pradesh	
	c	District	Kurnool	
	d	Village near Power House	Pinnapuram	
3		**Geographical Co- Ordinates**		
	a	**Upper Reservoir**		
		Latitude	15° 36’ 26" N	Unchanged
		Longitude	78° 15’ 13" E	
	b	**Lower Reservoir**		
		Latitude	15° 37’ 26" N	Unchanged
		Longitude	78° 15’ 30" E	
4		**Access To Project Site**		
	a	Airport	Hyderabad	Unchanged
	b	Rail head	Kurnool – 81 Kms	
	c	Road	Gorakallu	
	d	Port	Krishnapatnam	

S.No		Description	Existing Salient Features	Now Proposed
		Installed Capacity of Project	**1200 MW**	**1680 MW**
5		**Project**		
	a	Type	Pumped Storage Project	Pumped Storage Project
	b	Storage Capacity	9600 MWH	9304.40 MWH
	c	Rating	1200 MW	1680 MW
	d	Peak operation duration	8.00 Hours daily	5.54 Hours daily
6		**Pinnapuram Reservoir - Upper**		
	a	Live Storage	1.20 TMC	1.126 TMC
	b	Dead Storage	0.17 TMC	0.571 TMC
	c	Gross Storage	1.37 TMC	1.697 TMC
	d	Top of Dam	EL + 466.00 m	EL +466.00 m
	e	Full Reservoir level (FRL)	EL + 463.00 m	EL +460.80 m
	f	Min. Draw Down Level (MDDL)	EL + 441.50m	EL +445.50m
	g	Height of RCC Intake Structure	45.0 m	-
	h	Max Height of Embankment	35.0m	40.0 m
	i	Top Width of Embankment	10.0 m	7.0 m
	J	Length of Rock Fill Embankment dam with PVC Geo Membrane Facing (GFRD)		6724 m
	k	Type of Embankment	Rockfill Dam with Central Clay Core	Rockfill Dam with PVC Geo Membrane Facing (GFRD)
7		**Pinnapuram Reservoir - Lower**		
	a	Live Storage	1.20 TMC	1.118 TMC
	b	Dead Storage	0.22 TMC	0.432 TMC
	c	Gross Storage	1.42 TMC	1.550 TMC
	d	Top of Dam	EL + 343.00 m	EL +340.00 m
	e	Full Reservoir level (FRL)	EL + 340.00 m	EL +335.10 m
	f	Min. Draw Down Level (MDDL)	EL + 321.00 m	EL +321.80m
	g	Length of Rock Fill Embankment dam with PVC Geo Membrane Facing (GFRD)		3316m
	h	Max Height of Embankment	33.0 m	38.0 m

S.No		Description	Existing Salient Features	Now Proposed
		Installed Capacity of Project	**1200 MW**	**1680 MW**
	i	Top Width of Embankment	10.0 m	7.0 m
	j	Type of Embankment	Rockfill Dam with Central Clay Core	Rock Fill Embankment dam with PVC Geo Membrane Facing (GFRD)
8		**Approach Channel & Collection**		
	a	Type of Channel		Concrete Lined with Trapezoidal Shape
	b	Length of the approach channel		868.50 m
	c	Bed Width		190 m
	d	Full Supply Depth		9.00 m
	e	Bed fall		Flat Channel
	f	Side Slope of the Channel		1V:2H
	g	Design Discharge		1589.26 m^3/s
9		**Intake Structure**		
	a	Type		Diffuser Type
	b	Number of Vents		7 Nos.
	c	Size of Each Intake		27 m (W) x 10.97 m (H) including piers
	d	Length of each Intake		41.80 m (covered with RCC slab at top up to Intake Gate)
		Elevation of Intake center line	EL + 429.24 m	EL +432.70 m
	b	Elevation of bell mouth bottom	EL + 423.71 m	EL +428.95 m
	g	Design Discharge of each Intake (Turbine mode)		230.80 Cumec for units- 7 & 8 226.41 Cumec each for units- 1 to 6
	h	Trash rack type		Vertical with inclination of 15°
	i	Size of Trash Rack		3 nos. of 8.00m(W) x 10.97m(H) for each unit.
	j	Velocity through Trash rack		1.01 m/s
	k	Numbers & Size of Intake Service Gate		7 Nos. - 6.2 m (W) x 7.5 m (H) Vertical Lift Fixed Wheel type with

S.No		Description	Existing Salient Features	Now Proposed
		Installed Capacity of Project	**1200 MW**	**1680 MW**
				Independent Rope Drum Hoist
	l	Numbers & Size of Intake Maintenance Gate		7 No. - 6.2 m (W) x 7.5 m (H) Vertical Lift Fixed Wheel type with Independent Rope Drum Hoist
10		**Water Conductor System**		
	I	**Intake Tunnel (up to Exit portal)**		
	a	Type		Steel lined — circular
	b	Number of Tunnels		7 Nos.
	c	Diameter of Each Tunnel		7.5 m dia.
	d	Length of Tunnel		80.23 m each
	e	Design Discharge of each Tunnel		230.80 Cumec for units- 7 & 8 226.41 Cumec each for units- 1 to 6
	f	Velocity in the Tunnel		5.22 m/sec for unit 7 & 8 5.12 m/sec for unit 1 to 6
	g	Thickness of Steel Liner		20mm
	h	Grade of Steel Plate		IS: 2002 — Gr. 2
	II	**Buried Penstock (from Exit portal to start of Vertical Pressure Shaft)**		
	a	Type	Steel lined - circular	Circular
	b	Number of Penstock	5 Nos Independent Penstocks and 1 No of Independent Penstock bifurcated in to 2	7 Nos Independent Penstocks and 1 No of Independent Penstock bifurcated into 2
	c	Diameter of Penstock	7.0 m	7.5 m dia.
	d	Length of Penstock up to Vertical Shaft	760.0 m each	314.70 m (for Units-7 & 8) 333.18 m each (for Units-1 to 6)
	e	Thickness of Steel Liner		20 mm to 28 mm & 25 mm
	f	Grade of Steel Plate		IS:2002-Gr.2, Gr.3 & ASTM A 537 Cl.2
	III	**Vertical Pressure Shaft**		
	a	Type		Steel lined — circular
	b	Number of Pressure Shafts		7 Nos.

S.No		Description	Existing Salient Features	Now Proposed
		Installed Capacity of Project	**1200 MW**	**1680 MW**
	c	Diameter of shaft		7.5 m dia.
	d	Length of Vertical Shaft		84.30 m each (up to start of Horizontal Shaft)
	e	Thickness of Steel Liner		25 mm to 34 mm
	f	Grade of Steel Plate		ASTM A 517 Gr.F
	IV	**Bottom Horizontal Pressure Shaft**		
	a	Type		Steel lined — circular
	b	Number of Pressure Shafts		7 Nos, wherein 1 No Independent Pressure shaft bifurcated into 2 for smaller units
	c	Diameter of main pressure shaft		7.5 m
	d	Discharge in Main Pressure shaft		230.80 Cumec each for units- 7 & 8 226.41 Cumec each for units- 1 to 6
	e	Velocity in Main Pressure shaft		5.22 m/sec for unit 7 & 8 5.12 m/sec for unit 1 to 6
	f	Diameter of branch Pressure shaft		5.3 m
	g	Discharge in Branch Pressure shaft		115.40 m^3/s
	h	Velocity in Branch Pressure shaft		5.33 m/s
	i	Length of Bottom Horizontal Pressure Shaft		114.06 m (for Units-7 & 8) 155.20 m each (for Unit-1 to 6)
	j	Length of Bottom Horizontal branch Pressure Shaft		62.23 m (for Unit-7 & 8)
	k	Thickness of Steel Liner (7.5m Dia)		34 mm to 38 mm
	l	Thickness of Steel Liner (5.3m Dia)		26 *mm to 34 mm*
	m	Grade of Steel Plate		ASTM 517 GRADE-F
11		**Main Inlet Valve (MIV)**		
	a	Size of MIV		5.30 m Diameter (for larger unit)

S.No		Description	Existing Salient Features	Now Proposed
		Installed Capacity of Project	**1200 MW**	**1680 MW**
				3.80 m diameter (for smaller unit)
12		**Adit Tunnels**		
	a	Adit to Penstock Bottom		838.0 m long 9.0m dia. D Shaped Tunnel
	b	Escape Tunnel from Machine Hall		129.0 m long 6.5m dia. D Shaped Tunnel
13		**Powerhouse**		
	a	Type	Surface Powerhouse	Surface Powerhouse
	b	Center Line of Unit		El. 290.00 m
	c	Dimensions	L 240.00m x B 24.00 m x H 58.00 m	215.00 m (L) x 25.5 m (W) x 58.00 m (H)
	d	Size of Service bays		36 m (L) x 25.5 m (W)
	e	Service bay level		El. 303.50 m
	f	Crane Beam Level in Powerhouse		El. 316.80 m
	g	Size of Unloading Bay		44.70 m (L) X 20.0 m (W)
	h	Unloading Bay Level		El. 328.30 m
	i	Unit Installed Capacity		6x240 MW + 2X120 MW
	i	Unit Design Discarge		
	a	Generation mode		226.41 Cumecs & 115.40 Cumecs for 240 MW & 120 MW respectively
	b	Pump mode		189.60 Cumecs & 90.20Cumecs for 240 MW & 120 MW respectively
	ii	Net Head/Rated Head		
	a	Generation mode		121.43 m & 120.13 m for 240 MW & 120 MW respectively
	b	Pump mode		128.23 m & 128.63 m for 240 MW & 120 MW respectively
	iii	Head Loss (all units/one unit)		
	a	Generation mode		3.60 m & 4.90 m for 240 MW & 120 MW respectively

S.No		Description	Existing Salient Features	Now Proposed
		Installed Capacity of Project	**1200 MW**	**1680 MW**
	b	Pump mode		3.20 m & 3.60 m for 240 MW & 120 MW respectively
	c	TWL for Rated Power		330.67 m
	d	Minimum TWL		321.80 m
	e	Maximum TWL		335.10 m
14		**Tait Race Tunnel**		
	a	Type		Concrete Lined — Circular
	b	Number of Tunnel		8 Nos (6 individual tunnels for Larger units & 2 individual tunnels for Smaller units)
	c	Diameter for Larger Unit		8.7 m each
	d	Length for Larger Unit		145.50 m each
	e	Design Discharge in tunnel for larger unit		226.41 m^3/s
	f	Velocity in tunnel for larger unit		3.81 m/s
	g	Diameter for Smaller Unit		6.8 m each
	h	Length for Smaller Unit		160.43 m each
	Î	Design Discharge in tunnel for smaller unit		115.40 m^3/s
	j	Velocity in tunnel for smaller unit		3.18 m/s
15		**Tailrace Outlet Structure**		
	a	Type	Open Semi Circular	Diffuser Type
	b	Number of Outlet		8 Nos. (6 Nos. for Larger units & 2 nos. for Smaller units)
	c	Size of Each Outlet		23 m (W) x 10.5 m (H) for Larger Units 19.00 m (W) x 6.50 m (H) for Smaller Units
	d	Elevation of outlet centre line	EL + 305.70 m	EL +307. 92 m for Larger units EL +306.97 m for Smaller units
	e	Elevation of outlet bottom		EL +303.57 m

S.No		Description	Existing Salient Features	Now Proposed
		Installed Capacity of Project	**1200 MW**	**1680 MW**
	f	Trash rack type		Vertical with inclination of 15°
	g	Size of Trash Rack		3 no's of 6.67m(W) x 10.87m(H) for each larger unit 3 no's of 5.33m(W) x 7.25m(H) for each smaller unit
	h	Velocity through Trash rack		1.03 m/s
	i	Tail Race outlet Service Gate		6 Nos. - 6.85 m (W) x 8.7 m (H) for Larger Units & 2 Nos. - 5.35 m (W) x 6.8 m (H) for Smaller Units with Independent Hydraulic Hoist
	j	Tail Race outlet Stoplog Gate		1 set — 6.85 m (W) x 8.7 m (H) for Larger Units & 1 set — 5.35 m (W) x 6.8 m (H) for Smaller Units with Common Movable Gantry Crane
16		**Tail Race Channel**		
	a	Type of Channel	Trapezoidal Channel - Lined	Concrete Lined with Trapezoidal Shape
	b	Lenth of the channel	1300 m	1614.11 m
	c	Bed Width	70 m	20.88 m
	d	Full supply depth	6.00 m	12.80 m
	e	Bed slope	1 in 5000	1 in 1614.11
	f	Side Slope of the Channel		1V:1.6H
	g	Design Discharge		1589.26 Cumec
17		**Hydro- Mechanical Equipment**		
	a	**Intake Structure**		
		Trash Rack		
	i	No of bays in each trash rack	6 Nos – 21.0m high	8 Nos.- 10.5 m high each (6 no. large units) & 6.5 m high each (for 2 no. large units)
	ii	Intake Service Gate - 6 Nos	W5.77 m X H7.00 m (Vertical lift fixed wheel)	6 Nos.- 6.85 m (W) x 8.7 m (H) for Larger Units &2 Nos. - 5.35 m

S.No		Description	Existing Salient Features	Now Proposed
		Installed Capacity of Project	**1200 MW**	**1680 MW**
				(W) x 6.8 m (H) for Smaller Units with Independent Hydraulic Hoist
	iii	Intake Stop log Gate - 6 Nos	W5.77 m X H7.00 m (Vertical lift fixed wheel)	1 set – 6.85 m (W) x 8.7 m (H) for Larger Units & 1 set – 5.35 m (W) x 6.8 m (H) for Smaller Units with Common Movable Gantry Crane
	b	**Draft Tube Gates**	High pressure steel type slide gates	-
	i	No. of gates per unit	2 per unit - W 6.5 m X H 7.0 m (Vertical lift fixed wheel type)	-
	c	**Tailrace Outlet Structure**		
	i	No. of bays in each trash rack	6 Nos – 18.0m high	3 no's of 6.67m(W) x 10.87m(H) for each larger unit 3 no's of 5.33m(W) x 7.25m(H) for each smaller unit
18		**Electro-Mechanical Equipment**		
	a	Pump Turbine	Francis type, vertical shaft reversible pump-turbine	Unchanged
	b	Total No of units	7 no's (5 X 200MW & 2 X 100 MW)	8 no's (6 X 240MW & 2 X 120 MW)
	c	Total Design Discharge (Turbine Mode)	1162.85 Cumec	1589.26 cumec
	d	Rated Head in Turbine mode	119.27m	121.43 m
	e	Centre Line of Units		EL +290.00 m
	18.1	**Turbines**	**200MW**	**240 MW**
	i	Total No of units	5 Units (2 Nos with Variable speed & 3 Nos with Fixed Speed)	6 Units (All units are Fixed speed)
	ii	Turbine Capacity	200MW	240 MW
	iii	Turbine Design Discharge	193.81 Cumec for each unit	226.416 m3/s for each Unit
	iv	Rated Head in Turbine Mode		121.43 m
	v	Pump Capacity	244 MW	257 MW

S.No		Description	Existing Salient Features	Now Proposed
		Installed Capacity of Project	**1200 MW**	**1680 MW**
	vi	Rated Pumping Head	125.77 m	128.23 m
	vii	Rated Pump Discharge	178.42 Cumecs	189.60 cumec
	viii	Synchronous speed	136.36 rpm	187.50 rpm
	18.2	**Generator- Motor**		
	a	Type	03 phase, alternating current synchronous, generator motor semi umbrella type with vertical shaft	Unchanged
	b	Number of units	5 Units	6 Units
	c	Rated Capacity	Generator – 200 MW;	Generator – 240 MW
			Pump Input – 244 MW	Pump Input – 257 MW
	d	Rated Voltage	18.0 KV	Unchanged
	18.3	**Main Power Transformer**		
	a	Type	Indoor, 3-Ph transformers with Off-Circuit tap changer (OCTC)	Outdoor Three-Phase Power transformers with On Load tap changer
	b	Number of units	5 Units	6+1(spare) Units
	c	Rated Capacity of each unit	280 MVA	300 MVA
	d	Rated Voltage	Primary – 18.0 kV; Secondary - 400 kV adjustable range of the secondary voltage: -10% to + 10% (3kV/ tap)	Primary- 18 KV; Secondary- 400 kV adjustable range of the secondary voltage: -10% to +10% in 1.25% steps
	18.4	**Turbines**	**100MW**	**120 MW**
	a	Total No of units	2 Units (1 Nos with Variable speed & 1 Nos with Fixed Speed)	2 Units (both are Fixed speed)
	b	Turbine Capacity	100MW	120 MW
	c	Turbine Design Discharge	96.90 m^3/s for each unit	115.40 m^3/s for each Unit
	d	Pump Capacity	130 MW	123 MW
	e	Rated Head in Turbine mode	125.77 m	120.13 m
	f	Rated Head in Pump Mode		128.63 m
	g	Rated Pump Discharge	94.37 Cumec for each unit	90.20 cumec
	h	Synchronous speed	187.5 rpm	272.727 rpm
	18.5	**Generator- Motor**		

S.No		Description	Existing Salient Features	Now Proposed
		Installed Capacity of Project	**1200 MW**	**1680 MW**
	a	Type	Three (3) phase, alternating current synchronous, generator motor semi umbrella type with vertical shaft	Unchanged
	b	Number of units	2 Units	Unchanged
	c	Rated Capacity	Generator – 100 MW; Pump Input – 130 MW	Generator – 120 MW Pump Input – 123 MW
	d	Rated Voltage	18.0 kV	Unchanged
	18.6	**Main Power Transformer**		
	a	Type	Indoor, 3-Ph transformers with Off-Circuit tap changer (OCTC)	Indoor, 3-Ph transformers with On Load Tap Changer
	b	Number of units	2 Units	Unchanged
	c	Rated Capacity of each unit	150 MVA	
	d	Rated Voltage	Primary- 18 kV; Secondary- 400 kV adjustable range of the secondary voltage: -10% to + 10% (3kV/ tap)	Primary- 18 KV; Secondary – 400 kV adjustable range of the secondary voltage: -10% to +10% in 1.25% steps
19		**420KV Gas Insulated Switchgear (GIS)**		
	a	Type of GIS	Indoor Type	Unchanged
	b	No. of GIS units	One No.	
	c	Location	Inside GIS Building above ground	
	d	Scheme	Double Busbar Arrangement with bus sectionalize	
20		**POWER EVACUATI ON**		
	a	Voltage Level (KV)	400 KV	400 KV
	b	No. of Transmission lines	02 Nos for each connecting point	01 Double Circuit Transmission Line
	c	Conductor	Moose	Quad Moose
	d	Total Length	Line 2: 20 Kms to PGCIL 765/ 400 KV SS near Orvakallu 6 Km up to Central Pooling Substation of IREP	Central Pooling Substation (CPSS) 6 Km up to Central Pooling Substation of IREP
21		**Estimated Cost**		
	a	Civil Works & Other works	2684.76 Cr.	5470.44 Cr

S.No		Description	Existing Salient Features	Now Proposed
		Installed Capacity of Project	**1200 MW**	**1680 MW**
	b	E & M Works incl transmission	2263.68 Cr.	2493.57 Cr
	c	IDC	519.58 Cr.	1559.00 Cr
		Total Project Cost with IDC	**5468.02 Cr.**	**9523.01 Cr**

27.2.3 The EAC during deliberations noted the following:

The Expert Appraisal Committee (EAC) deliberated on the information submitted, as well as the presentation made during the meeting. It was observed that the proposal pertains to the request for an amendment to the Environmental Clearance for the Pinnapuram Integrated RESP-Storage Project (1200 MW) located in the sub-districts of Gadivemula, Orvakal, Panyam, in the districts of Nandyal and Kurnool, Andhra Pradesh, submitted by M/s Greenko AP01 IREP Private Limited.

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

The EAC observed that the proposal submitted by the PP is for amendment in Environmental Clearance granted by the Ministry on 14.07.2020 for construction of Pinnapuram Integrated RESP-Storage project (1200 MW) in Tehsil Nandyal, District Kurnool, Andhra Pradesh by M/s Greenko Energies Private Limited. Subsequently, transfer of EC from M/s Greenko Energies Private Limited to M/s Greenko AP01 IREP Private Limited accorded by the Ministry on 13.02.2023.

The EAC noted that the following are the reasons for seeking amendment in EC:

- As per SECI requirement, irrespective of the Energy Storage Systems (ESS) technology being implemented in the project, the developer shall be responsible for meeting off-peak as well as peak hours supply of minimum 6 hours on daily basis.

- Consequently, the Pinnapuram IRESP generation hours have been reduced to 5.54 Hrs from 8 hr by reconfiguration to 1680 MW from 1200 MW and changing the unit capacities to 240 MW each (6 No) & 120 MW each (2 No) from 200 MW each (5 no) & 100 MW each (2 No) respectively.

- Thus, the project is being reconfigured and optimized to 1680 MW (6X240 MW + 2X120 MW) with a storage capacity of 9304.40 MWh from 9600 MWh.

- As the project capacity is revised, environment clearance issued to Pinnapuram IRESP – Storage Project (1200 MW), needs to be amended in compliance with provisions

made in EIA Notification, 2006.

During the deliberation the EAC noted that major changes from earlier EC has been proposed by the PP such as modification in capacity from 1200 MW to 1680 MW without changing any location of the project, water requirement from 1.2 TMC to 1.30 TMC, increase in dimensions of dam of both lower and upper reservoir and land requirement for the project has been increased from 713.65 Ha to 785.58 Ha in which forest land has been increased from 365.66Ha to 415.83 Ha, Private land increased from 119.65Ha to 192.02 Ha and Government land has been deceased from 228.34Ha to 177.73Ha. Further, the EAC noted that Stage- I Forest Clearance for diversion of 365.66 Ha of forest land accorded by Ministry on 23/04/2020 and Stage II was issued on 24/05/2021 (for 46.64 ha) and on 24/05/2022 and corrected on 30/05/2022 (for 319.02 Ha).

The application for diversion of 50.17 ha of additional forest land is filed vide FP/AP/HYD/IRRIG/462719/2024 dated 15/02/2024. It was further noted that as per provisions in RFCTLARR, 2013; private land is purchased by direct negotiation and total private land of 192.02 ha, belonged to 244 land owners and process of acquiring and purchasing of entire private land is completed.

The EAC noted that PP has submitted additional EIA/EMP report with fresh baseline data collected during November 2024- December 2024. It has been noted that as per document, the ambient air quality monitoring done in the study area, the baseline concentration of Particulate Matters (PM10 & PM2.5), SOx and NOx as compared to the baseline data collected previously for EIA report were slightly increased near the sites located around various components of Pinnapuram IRESP Storage Project. However, the concentration of Particulate Matters (PM10 & PM2.5), SOx and NOx were found below the permissible limits as prescribed by CPCB.

The EAC noted that as per EIA analysis of Surface water samples shows no significant changes due to the construction activities in the area. Water Quality of most of the surface water samples were found under Class 'D' (i.e., water only suitable for Propagation of Wildlife and Fisheries) according to Water Quality Criteria of Central Pollution Control Board. As compared to baseline data collected previously, no significant changes were observed in surface water quality of the area. According to WQI values obtained for different locations, in general, is in the 'Medium' category except at site SW3, Pond located near Pinnapuram village where the water quality was found under Bad category.

During the meeting, the EAC inquired about revised EMP budget, Time bound action plan to stabilize Muck disposal sites, agreement and sale deeds of newly added landowners for the private land in upper reservoir, Conservation Program of Great Indian Bustard being carried out at Rollapadu Wildlife Sanctuary, CEA approvals as per revised capacity of 1680 MW. The PP vide email dated 28.04.2025 submitted the desired information sought by the EAC and found satisfactory. The EMP budget has been at time of grant of EC was 11839.55 Lakhs whereas PP has spent 15637.31 Lakhs till date and additional 1826 lakhs has been proposed.

The Committee noted that the Public hearing was carried out in District kurnool on 02.11.2018 under the chairmanship of the collector and district Magistrate, kurnool and compliance of the

commitments made by the PP during the Public hearing was found satisfactory. The EAC noted that the project location falls under two district as information submitted by the PP on Parivesh Portal whereas public hearing has been conducted in only one district i.e. Kurnool. The PP informed that there is no change in location of the project. At the time of EC in 2020, entire project was in Kurnool district. Public Hearing meeting was held on 02/11/2018 near Mandal Parishad Upper Primary School, Pinnapuram, Panyam Mandal, Kurnool District, Andhra Pradesh. During the process of re-organization of districts of Andhra Pradesh, a new Nandyal district was carved out of Kurnool district as per G.O. Ms. No. 192, Revenue (Lands-IV), dated 04/04/2022.

The EAC observed that the proposal qualifies the criteria to be considered under the prvisions of the Para 7 (ii) of the EIA Notification, 2006, as amended. It was also observed that in view of compliance of the commitments made by the PP during the Public hearing and land acquisition status there is no need for repeat public hearing.

The EAC observed that Certified Compliance Report has been submitted by IRO on 06/11/2024 wherein most of the EC conditions as complied/Being Complied. Some conditions are partly complied and one not complied condition is related to Multi-Disciplinary Committee (MDC) has not been constituted. Therefore, it was advised that PP shall submit a time bound action plan for ensuring the compliance of partly complied points within 15 days alongwith a proposal for formation of MDC to the Ministry.

The EAC appreciated trees translocation technique used by the PP as their survival rate is more than 80%.

27.2.4 The EAC after detailed deliberation on the information submitted and as presented during the meeting, **recommended** the proposal for grant of amendment in Environmental Clearance dated 14.07.2020 for Pinnapuram Integrated RESP-Storage project (1200 MW to 1680 MW) in Sub District Gadivemula, Orvakal, Panyam, District Nandyal and Kurnool, Andhra Pradesh by M/s Greenko AP01 IREP Private Limited., under the provisions of EIA Notification, 2006, as amended subject to the standard EC conditions along with following specific conditions:

i. All the conditions mentioned in the EC letter dated 14.07.2020 and subsequent EC transfer dated 13.02.2023 shall remain unchanged.
ii. Stage-I Forest Clearance for 50.17 ha of additional forest land involved shall be submitted before grant of prior Environmental Clearance.
iii. As the total project cost has been increased, the Environmental Management Plan (EMP) budget shall be revised proportionally i.e @ 2.16% of current project cost, in each component of EMP. A time bound action plan for implementation of revised EMP shall be submitted to regional office, MoEF&CC.

The meeting concluded with thanks to the Chair

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ATTENDANCE

27th MEETING OF RE-CONSTITUTED EXPERT APPRAISAL COMMITTEE (EAC)
(RIVER VALLEY & HYDRO-ELECTRIC PROJECTS)

DATE : 27.03.2025

TIME : 10.30 AM onwards

VENUE : Indus Hall, Indira Paryavaran Bhawan, New Delhi.

Sl.No.	Name of Member	Role	Signature
1.	Prof. G. J. Chakrapani	Chairman	
2.	Dr. Udaykumar R. Y.	Member	
3.	Dr. Mukesh Sharma	Member	
4.	Dr. J V Tyagi	Member	
5.	Shri Kartik Sapre	Member	
6.	Shri Ajay Kumar Lal	Member	
7.	Shri Rajeev Varshney	Member	
8.	Shri Balram Kumar	Member	
9.	Dr. J.A. Johnson, Scientist - F	Member	
10.	Dr B. K. Das, Director Dr. A. K. Sahoo, Senior Scientist	Member	
11.	Shri Yogendra Pal Singh	Member Scretary	

Approval of the Chairman

---- On Sat, 12 Apr 2025 08:12:13 +0530 **chakrapani govind <chakrapani.govind@gmail.com>** wrote ---

Approved.
Chakrapani

On Sat, 12 Apr, 2025, 08:07 Yogendra Pal Singh, <yogendra78@nic.in> wrote:

> Dear Sir,
>
> As suggested the corrections/modifications **(highlighted in yellow)** have been incorporated in the draft minutes and no other comments received from EAC members, accordingly the draft MOM is attached herewith for 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**

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