सत्यमेव जयते

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

Minutes of 12TH MEETING OF EXPERT APPRAISAL COMMITTEE meeting River Valley and Hydroelectric Projects held from 18/07/2024 to 19/07/2024

Date: 02/08/2024

MoM ID: EC/MOM/EAC/596917/7/2024

Agenda ID: EC/AGENDA/EAC/596917/7/2024

Meeting Venue: INDIRA PARYAVARAN BHAWAN

Meeting Mode: Physical

Date & Time:

18/07/2024	10:30 AM	05:30 PM
19/07/2024	10:30 AM	05:30 PM

1. Opening remarks

The 12th meeting of the EAC for River Valley & Hydroelectric Projects organized by the Ministry of Environment, Forest and Climate Change, Indira Paryavaran Bhawan, Jor Bagh Road, New Delhi, was held on 18th – 19th July, 2024 through Physical mode, under the Chairmanship of Prof. G. J. Chakrapani. The list of Members present in the meeting is at **Annexure**.

Before taking up the agenda for discussion the EAC deliberated upon improving the quality of EIA/EMP reports. The chairman suggested that the Project Proponents may get the reports vetted by a no conflict third party reputed consultant.

2. Confirmation of the minutes of previous meeting

The EAC confirmed the minutes of 11th EAC meeting held on 27th June, 2024.

3. Details of proposals considered by the committee

Day 1 -18/07/2024

3.1. Agenda Item No 1:

3.1.1. Details of the proposal

Pumped Storage Project(9X150MW) at Upper Sileru village , Godem Kotha Veedhi (M) by **Andhra Pradesh Power Generation Corporation Limited** located at **ALLURI SITHARAMA RAJU,ANDHRA PRADESH**

Proposal For		Fresh EC	
Proposal No	**File No**	**Submission Date**	**Activity (Schedule Item)**
IA/AP/RIV/456248/2023	J-12011/18/2019-IA.I (R)	11/01/2024	River Valley/Irrigation projects (1(c))

3.1.2. Project Salient Features

12.1.1: The proposal is for grant of Environmental Clearance (EC) to the project for Upper Sileru Open Loop Pumped Storage Project (1350 MW) in an area of 332.44 Ha at Village Valasagedda, Busikonda, Sub District Gudem Kotha Veedhi, District Alluri Sitharama Raju, Andhra Pradesh by M/s Andhra Pradesh Power Generation Corporation Limited.

12.1.2: 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 proposal is for environmental clearance for Upper Sileru Pumped Storage Project (9 x 150 MW) located at Upper Sileru, Gudem Kotha Veedhi (Mandal), Alluri Sitarama Raju (District), Andhra Pradesh by M/s. Andhra Pradesh Power Generation Corporation Limited.

ii. The proposed pumped storage project is located in Gudem Kotha Veedhi Mandal of district Alluri Sitarama Raju in the state of Andhra Pradesh. The project is situated close to Sileru village which is around 200 km from Visakhapatnam. The Proposed Project is located on Sileru River.

iii. The project envisages re-utilisation of water of the Guntawada reservoir which is presently being used for power generation at existing Hydro Electric Power Station and surplus spilled from the reservoir is proposed to be stored in Donkarayi reservoir located on the downstream side for reutilisation during pumping mode. The coordinates of Guntawada reservoir are 18o 03'34" North and 82o 02'18" East.

iv. The intake site is located at village Sileru, which is about 1.50 km from existing Guntawada Dam on Sileru River. The power house is located on the left bank of the Sileru River, which is about 2.50 km from Sileru village. The geographical co-ordinate of the project are Guntawada Reservoir (Upper) – Latitude 18°03’33”N, Longitude 82°02’15”E and Donkarayi Reservoir (Lower) – Latitude 17°56’02” N, Longitude 81°47’46”E. The coordinates of the proposed intake at the diversion site are 18°3’3.62” N and 82°2’17.53” E while that of the power house are 18°1’57.60” N and 82°1’15.23” E.

v. The project proposal was considered by the Expert Appraisal Committee (Hydro River Valley Sector) in its meeting held on 23.04.2019 and recommended for grant of Terms of References (ToRs) for the Project. The ToR has been issued by Ministry vide letter No. J-12011/08/2019-IA I(R) dated 03.06.2019

vi. The Upper Sileru Pumped Storage Project envisages construction of:

- Ø About 138 m long approach channel designed to feed required quantum of water to three intake tunnels.
- Ø Intake structure designed to draw required quantity of water through three headrace tunnels of 12 m diameter.
- Ø Three (3) HRTs each of 12 m finished diameter and about 2,768 m length from downstream of Intake till upstream Surge shaft.
- Ø An open to sky upstream Surge shaft about 2,768 m downstream of intake location.
- Ø Surface powerhouse with deepest excavation level at El 265.0 m, service bay at El 330.00 m and centre line of pump/turbine at El 281.50 m about 350 m downstream of upstream surge shaft. Powerhouse will have nine pumps cum turbine of 150 MW each.
- Ø Downstream surge shaft at 73.5 m downstream of powerhouse.

- Ø Three (3) nos. of tailrace tunnels each of 12 m diameter and about 2,465 m length from downstream surge shaft up to outlet structure

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

District Alluri Sitarama Raju of state Andhra Pradesh and District Malkangiri of state Odisha will be the study area for the proposed project.

- Ø Total Households - 7100
- Ø Total Population - 29303
- Ø Male Population - 14187
- Ø Female Population - 15116
- Ø Population<6 years - 5344
- Ø Literacy Rate - 53.31%

viii. **Project Cost:** The estimated project cost is Rs. 11,154.39 Cr including existing investment of Rs 2402.53 crores. Total capital cost earmarked towards environmental pollution control measures is Rs 125.83 Cr and the Recurring cost (operation and maintenance) will be about Rs 142.13 Lakh per annum.

ix. **Project Benefit:** Total Employment will be 1100 persons during construction and 100 persons during Operation phase. The project proposes to allocate Rs 1,493.00 lakh @ of 0.125 % towards CER (as per Ministry's OM dated 2018).

x. **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 Sileru is flowing nearer in South West direction.

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

GoAP accorded in principle approval on 19.10.2021 to establish the project by APGENCO.

xii. **Resettlement and rehabilitation:**

The Revenue Department has identified 22 Nos ROFR patta holders in Sandkori village, who are Project Affected Families (PAFs). The tentative cost estimate for the proposed Rehabilitation & Resettlement Entitlements is Rs. 360 lakh.

xiii. **Scheduled –I species**

Schedule-I species are not observed in the project area, however they are present in study area. Species are: Indian wolf, Ratel, Sloth bear, Four horned Antelope, Indian Chevrotain, Leopard Cat.

xiv. **Alternative site studies:**

Four alternatives have been studied:

- Alternative-1: Alignment of water conductor system as proposed in FR but with surface powerhouse located about 3000m from upper intake (in place of underground PH in FR)
- Alternative-2A: Project aligned towards left of Alternative 1 layout with HRT aligned towards APGENCO guesthouse/ hill side and planning a surface powerhouse located about 3600 m downstream of approach channel and open to sky surge shafts.
- Alternative-2B: Similar to alternative 2A, an underground powerhouse in place of surface powerhouse. The powerhouse location will be about 650 m upstream of surface powerhouse proposed in Alternative 2A.
- Alternative-3: Project aligned towards right of Alternative 1 with Intake located towards Guntawada weir and suitably aligning Water Conductor System/ Tunnels and planning a surface powerhouse located about 4500m downstream of approach channel and open to sky surge shafts.

Salient features of all the alternatives are tabulated below:

Component	Length (m)			
	ALT-1	ALT-2A	ALT-2B	ALT-3
Approach Channel	138	193	193	148
Headrace Tunnel	2768	3031	2370	3959

Pressure Shaft	385	392	392	392
Draft Tube	73.5	209	209	209
Tailrace Tunnel	2465	2314	2975	2360
Total	**5829.50**	**6139**	**6139**	**7068**

Alternative 1

Alignment and length of water conductor system has been kept identical to the alignment adopted in FR. In place of underground powerhouse, transformer cavern and surge pool, a surface powerhouse with upstream and downstream surge pools is proposed. The powerhouse is proposed about 3325m downstream of intake location. Suitable adits for excavation of HRT, TRT, upstream and downstream surge pools and powerhouse will be required. Powerhouse excavation is expected to extend up to depth of 80m below natural ground level and will need adequate rock support planning. Total length of water conductor system in this alternative is 5829.50 m.

Alternative-2A

Approach channel is proposed close to the location in alternative 1 but with a length of about 193 m is envisaged as compared to the approach channel length of about 138 m in Alternative-1. It is anticipated that good geological condition for locating Intake site will be available at the end of approach channel in this alternative. Also, this layout provides adequate and safe rock cover for HRT although the length of HRT will be longer by about 263 m. This alternative also provides suitable location of upstream and downstream surge shafts as well as Surface Powerhouse at Ch 3600 m from approach channel. This alternative also involves about 309.5 m longer Water Conductor System in comparison to Alt-1 including 55 m longer approach channel, 263 m longer HRT and 151 m shorter TRT.

Alternative-2B

Approach channel, intake, HRT and TRT alignment is kept identical to Alternative 2A. In this alternative, an underground powerhouse is proposed in place of surface powerhouse in alternative 2A. Underground powerhouse is proposed about 660 m upstream relative to the proposed location of surface powerhouse in 2A.

Alternative-3

Approach channel is proposed in between the spillway of main dam and head regulator of existing powerhouse. Approach channel length of 148 m is proposed followed by 3959 m long HRT and 2360 m long TRT. The total length of water conductor system in this alternative is about 7068 m. This alternative involves about 1238.5 m longer Water Conductor System in comparison to Alt-1 including 10 m longer approach channel, 1191 m longer HRT and 105 m shorter TRT. Availability of adequate rock cover for a part of HRT length exists based on the detailed topographic survey carried out in this area. In this alternative, the TRT will pass below the tailrace channel of existing powerhouse and adequate rock cover is available at the crossing based on topographical survey and geological investigation.

Conclusion

Out of above alternatives, Alternative 3 has the longest water conductor system and the TRT will pass below the tailrace channel of existing project. Therefore, this alternative is not considered suitable for development of Upper Sileru PSP.

Water Conductor system of Alternative 2A and 2B is longer as compared to water conductor system of Alternative 1 by about 309.5 m. Alternatives 2A/2B have the advantage of availability of adequate rock cover along entire length of water conductor system as well as availability of favourable geological condition for HRT excavation.

Alternative - 1 has the shortest water conductor system in addition to availability of adequate rock

cover & favourable geological conditions and detailed topographical survey has been carried out along entire alignment of water conductor system. Accordingly, Alternative 1 is proposed to be adopted for further development and for planning of geological investigation. Project layout as per Alternative 1 has been optimized with respect to hydraulic, geological and structural stability.

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

Municipal Solid Waste, Source: Labour camps, Qty (TPA): 244.55

Estimated Muck to be generated: Out of 82,14,023 cum of excavated muck, 4,19,900 cum of muck will be used in backfilling of coffer dam and 10,02,858 cum in concreting. Remaining quantity of muck (67,91,265 cum) shall be disposed at pre-designated muck disposal sites

xvi. Public Hearing for the proposed project has been conducted by the State Pollution Control Board on 01.04.2023 and the advertisement for conducting Public Hearing was published on 26.02.2023 in two newspapers i.e., “Sakshi” (Telugu) and “The Indian Express” (English). The Public Hearing meeting was chaired by Sri J. Shiva Srinivasu, IAS, Joint Collector & Additional District Magistrate, Alluri Sitarama Raju District. The main issues raised during the public hearing are related to

- 50 bedded Hospital in the project, free Medical facilities to local tribal people
- Employment for local people
- Repairs to R&B Road
- Education to local tribal people in DAV School
- Power Supply Interruptions
- R&R for Sandkori Villagers

xvii. The salient features of the project are as follows:-

1. **EAC MEETING DETAILS**

EAC meeting/s	12th Meeting of The Expert Appraisal Committee on River Valley Projects
Date of Meeting/s	18.07.2024
Date of earlier EAC meetings	EAC Meeting held on 23.04.2019 for grant of Terms of Reference EAC Meeting held on 09.02.2024 for grant of Environmental Clearance

2. **Project Details**

Name of the Proposal	Upper Sileru Pumped Storage Project (9 x 150 M

	W)
Proposal No.	IA/AP/RIV/4562 48/2023
Location (Including Coordinates)	Upper Sileru, Gudem Kotha Veedhi (Mandal), Alluri Sitaramaraju (District), Andhra

	Pradesh Guntawada Reservoir (Upper) – Latitude 18° 03’ 33” N, Longitude 82° 02’ 15” E Donkarayi (Lower) – Latitude 17°

	56’02” N Longitude 81° 47’ 46” E
Company’s Name	M/s Andhra Pradesh Power Generation Corporation Limited
CIN no. of Co	U40109AP1998S

mpany/user agency	GC10918 7
Accredited Consultant and certificate no.	WAPCOSLIMITED, NABET/EIA/21124/RA0222 Validity: 24.07.2024
Pro	Upp

ject location (Coordinates/ River/ Reservoir)	er Siler u, Gude m Kotha Vedhi (Mandal), Allur i Sita rama Raju (District), Andhra Pradesh Guntawada Reservoir (Upper) –

	Latitude 18° 03’ 33” N, Longitude 82° 02’ 15” E Donkarayi (Lower) – Latitude 17° 56’ 02” N Longitude 81° 47’ 46” E

Inter-state issue involved	No
Proposed on River/ Reservoir	Siler u River a tributary of Sabari River
Type of Hydro-electric proje	Pumped Storage Project

ct	
Seismic zone	Zone-II

3. **Category details:**

Category of the project	A
Capacity / Cultural command area (CCA)	1350 MW
Attracts the General Conditions (Yes/No)	No
Additional information (if any)	-

4. **ToR/EC Details:**

ToR Proposal No.	IA/AP/RIV/1010 74/2019
EAC meeting date	23.04.2019
ToR Letter No.	F.No. J-12011/08/2019-IA

	I(R)
To R grant Date	03.06.2019
Cost of project	Rs. 11,881.50 Crore (Incl. IDC) as per DPR Rs. 11,154.39 Crore (Incl. IDC) as per TEC Clearance
Total area of Project	326.47 ha
Hei	-

ght of Dam from Bed (EL)	
Details of submergence area	Both upper and lower reservoirs are existing reservoirs
District to provide irrigation facility (if applicable)	Nil
Details of tunn	**HEAD**

els on upp er l eve l & low er lev el a nd len gth of can al (if a ppl ica bl e)	**R A C E T U N N E L (H R T)** Ty pe: Fi nis he d M odi fie d Ho rse Sh oe Di am ete r: 12 m No s.: 3 Av era ge Le ngt h: 2,7 68 m **PE NS T O C K T U**

	NNEL/PRESSURESHAFTS Type: Circular Steel Lined/ embedded pressure shaft independent Nos.: 9 Diameter: 6 m Length of each pens

	tock: 385 m **TAILRACE TUNNEL (TRT)** Type: Finished Modified Horse Shoe Diameter: 12 m Nos.: 3 Average Length: 2,465 m

No. of affected Village	1
No. of Affected Families	22
Project Benefits	Total energy generation of 3501.89 MU annually, Upliftment of Socio economic condition of S

	tudy area villages
R&R details	Yes, Yet to start
Catchment area/ Command area	Both upper and lower reservoirs are existing reservoirs
Types of Waste and quantity of generation during construction	Municipal Solid Waste Source: Labour camps

n/Operation	Qty (TPA): 244.55 Construction Waste Source: Construction work Qty (TPA): 6063
Material used for blasting and its Composition as per DGMS standards.	Will be finalised during pre-construction market survey

E-Flows for the Project	Upper reservoir (Guntawada Reservoir) and Lower reservoirs (Donkarayi Reservoir) are under operation since 1980’s. No additional diversion is envis

	aged, except for the losses, which is order of less than 0.5% in daily filling and emptying of reservoirs. Thus, no Environmental Flows are required for

	the proposed project.
Is Projects earlier studied in Cumulative Impact assessment & Carrying Capacity studies(CIA&CC) for River in which project located. If y	NA

es, then c) E-flow with TOR/ Recommendation by EAC as per CIA&CC study of River Basin. d) If not the E-Flows maintain criteria for sustaining river ecosystem.	

Details on provision of fish pass	NA
Project benefit including employment details (no of employee)	During construction phase: 1100 During operation phase: 100
Area of Compensatory Afforestation (CA) with tentative no	193.01 ha

of plantation.	
Previous EC details	NA
EC Compliance Report by R.O, MOEF&CC	NA

5. **Electricity Generation capacity**

Powerhouse Installed Capacity	1350 MW
Generation of Electricity Annually	3501.89 MU
No. of Units	09 of 150 MW each

6. **Muck Management Details:**

No. of proposed disposal area/ (type of land-Forest/Pvt land)	2 (two) pre-designated muck disposal sites
Cross section of proposed muck area, Height of muck with slope.	-
Distance of muck disposal area(location), from muck generation sources (project area)/River, HFL of proposed muck	-
Total Muck Disposal Area	74.58 ha
Estimate Muck to be generated	Out of 82,14,023 cum of excavated muck, 4,1

	9,900 cum of muck will be used in backfilling of coffer dam and 10,02,858 cum in concreting. Remaining quantity of muck (67,91,265 cum) shall be disposed at pre-designated muck disposal sites
Transportation	By road
Monitoring mechanism for Muck Disposal	Enclosed in EIA/EMP report

7. **Land Area Breakup:**

Private land	-
Government land/Forest Land	193.01 Ha, Forest Land 133.46 ha, Govt Land (APGENCo)
Submergence area/Reservoir area	-
Land required for project components	326.47 Ha

8. **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	
National Park	No	
Wildlife Sanctuary	No	
Archaeological sites monuments/historical temples etc	No	
Additional information (if any)	No	

Availability of Schedule-I species in study area: Schedule-I species are not observed in the project area, however present in study area.

9. **Public Hearing (PH) Details**

Advertisement for PH with date	26.02.2023
Date of PH	01.04.2023
Venue	At APGENCO grounds (at Proposed site Upper Sileru (V), Gudem Kotha Veedhi (M), Alluri Sitarama Raju district, Andhra Pradesh
Chaired by	Joint collector and Addl. Dist. Magistrate ASR District, A.P

Main issues raised during PH	• 50 bedded Hospital in the project, free Medical facilities to local tribal people • Employment for local people • Repairs to R&B Road • Education to local tribal people in DAV School • Power Supply Interruptions • R&R for Sandkori Villagers
No. of people attended	74

10. **Brief of base line Environment**

Particulars	**Details**
Period of baseline data collection/ Sampling period.	01/11/2020 To 31/08/2021, All three seasons.
(Air, n	**Air: PM_{10}, $PM_{2.5}$, SO_2 and NO_2** Par | W | P | M | P

oise, water, land)

ameter	inter Season (µg/m^3)	re-monsoon Season (µg/m^3)	onsoon Season (µg/m^3)	ermisible Standards (µg/m^3)
PM_{10}	37.98-62.51	37.86-61.88	39.46-51.2	100
$PM_{2.5}$	21.38-34.59	21.43-34.10	19.17-25.81	60
NO_2	19.86-34.96	20.33-35.70	17.9-23.07	80
SO_2	7.14-	6.63-	6.75-	80

	8.06	8.08	7.76	

Noise: Equivalent day time and night time noise level

Season	Day Time Equivalent Noise level dB(A)	Permissible Standards dB(A)
Winter	44.6 to 45.7	55
Pre-monsoon	43.6 to 44.6	55
Monsoon	41.40 to 43.20	55

Surface Water: Physico-chemical and biological parameters

Parameter	**Winter Season**	**Pre-monsoon Season**	**Monsoon Season**	**Drinking Water Quality Standards**
pH	6.03 to 6.79	5.90 to 7.2	5.5 to 7.29	7.0 - 8.5
El	3	3	3	-

ectrical Conductivity (µS/cm)	4.9 to 85.7	4.2 to 85.4	2.2 to 92.4	
Total Hardness (mg/l)	12 to 24	12 to 30	19 to 35	200
BOD (mg/l)	16.22 -< 0.01	16.22 -< 0.04	10 -< 0.4	-
COD (mg/l)		16.222 -< 0.01	11 -< 0.01	-

- The heavy metal concentration in the study area is below the permissible limit used for drinking purposes

Soil Quality:

Parameter	Winter se	Pre-monsoon seas	Monsoon sea

	as on	on	son
pH	6.08 to 7.15	6.02 to 7.17	6.00 to 7.10
Electrical Conductivity (µS/cm)	0.013-0.072	0.010-0.081	0.005-0.069
Texture	Sandy clay	Sandy clay	Sandy clay

flora and fauna of the project area,

Flora

Dominant tree species found in this forest were- *Acacia auriculiformis, Aegle marmelos, Albizia odoratissima, Azadirachta indica, Bombax ceiba, Eucalyptus globulus, Ficus racemosa, Gymnocladus dioica, Haldina cordifolia, Holarrhena pubescens, Syzygium cumini and Tectona grandis*

Dominant shrub species were- *Chromolaena odoratum, Clerodendrum infortunatum, Combretum decandrum, Lantana camara, Mimosa hamata, Phoenix sylvestris and Zizyphus mauritiana.*

Dominant herbs were- *Achyranthes aspera, Ageratum conyzoides, Alternanthera sessilis, Corchorus aestuans, Cynodon dactylon, Nicotiana plumbiginifolia, Persicaria barbata, Saccharum spontaneum and Vetiveria zizanioides*

	Fauna: **Mammals** A total of 32 mammalian species of 16 families were recorded from study area. Jackal, Jungle Cat, Mongoose, Spotted Deer, Wild Boar, Rhesus Macaque, Hanuman Langur are common in area **Avi-Fauna** Common species included Blue Rock Pigeon, Spotted Dove, Speckled Piculet, Red-whiskered Bulbul, Red-vented Bulbul, Blyth's Reed-Warbler, Greenish Leaf-Warbler, Brook's Flycatcher, Brown Shrike, Purple-rumped Sunbird, Spotted Munia, White-rumped Munia, Little Brown Dove, Jungle Crow and House Sparrow. **Herpetofauna** *Garden Lizard, Brooke's House Gecko, Monitor Lizard, Keeled India Mabuya, Speckled Cobra, Trinket Snake, Indian Bullfrog, and Indian Skipper Frog were common species of the study area.* **Butterfly** *Eurema hecabe*, *Junonia lemonias*, *Ypthima huebneri*, *Euploea core*, *Neptis hylas*, *Danaus chrysippus*, *Euthalia aconthea* and *Precis iphita* were most common species in the Study area
aquatic ecology, etc	A total of 65 benthic diatoms were recorded from all sites of study area *Achnanthes gibberula*, *Fragilaria pinnata*, *Navicula rhynchocephala*, and *Cymbella rupicola* were most common taxa recorded from all the sites *Cinygma* sp. and *Hydroporus* sp. were relatively common taxa, recorded from most of sites. **Fisheries**

	Notopterus notopterus, Catla catla, Cirrhinus mrigala, Labeo rohita, Garra mullya, Mystus vittatus, Mastacembelus pancalus, Channa punctata, and *Channa gachua* were predominant fish species of the region.
Brief description on hydrology and water assessment as per the approved pre-DPR:	No new dam is proposed and the water demand will be met from existing Guntawada and Donkarayi reservoirs. 1.7 TMC of water will be used from Guntawada Reservoir for PSP in generation mode during peak hours and the same quantity of water will be pumped back from Donkarayi Reservoir to Guntawada Reservoir during off-peak hours. 1.7 TMC of water required for PSP is one-time requirement only.

11. **Court cases details: NIL**

12. **Status of other statutory clearances**

<table>
<tr><th>Particulars</th><th>Letter no. and date</th></tr>
<tr><td>Status of Stage- I FC</td><td>Application submitted, In process
Proposal No. FP/AP/HYD/IRRIG/423651/2023, Dated: 23.11.2023</td></tr>
<tr><td>Approval of Central Water Commission</td><td><table><tr><th>Aspect</th><th>Status</th></tr><tr><td>General layout</td><td>Concurrence received on 14.08.2020</td></tr><tr><td>Hydrological s tudies</td><td>Concurrence received on 24.06.2020</td></tr></table></td></tr>
<tr><td>Approval of Central Electricity Authorit y</td><td>PPS studies Concurrence received on 05.01.202 1
TEC accorded by CEA vide File No.CEA-SY-2 5-24/1/2020-PAC Division-Part(1), dt.13.06.202 3</td></tr>
<tr><td>Additional detail (If any)</td><td>Nil</td></tr>
<tr><td>Is FRA (2006) done for FC-I</td><td>Yes, ROFR Certificate issued by the District Co llector</td></tr>
</table>

13. **Details of the EMP**

The total amount to be spent for various measures recommended in Comprehensive EIA report would be Rs.127.72 crore and recurring expenses will be Rs 142.13 Lakh/Year.

S. No.	Item	Cost (Rs. lakh)
1. Capital Expenditure		
A. Mitigation Measures		
1.	Stabilization of Muck Disposal Sites	710.0
2.	Solid waste Management	45.73
3.	Environmental Management in Road Construction	500.0
4.	Control of Water Pollution	375.0
5.	Control of Air Pollution	114.3
6.	Control for Noise Pollution	29.0
7.	Provision of Free Fuel	430.34

S. No.	Item	Cost (Rs. lakh)
8.	Compensatory Afforestation	1698.49
9.	Biodiversity Conservation Plan	127.0
10.	Wildlife protection Plan	258.6
11.	Habitat Improvement for Avi-fauna	28.00
12.	Fisheries Management Plan	102.56
13.	Public Health Delivery System	197.7
	Sub-Total (A)	**4616.72**
B. Additional Measures		
14.	Rehabilitation and Resettlement	360.00
15.	Corporate Environmental Responsibility	1493.00
16.	Local Area Development Plan	5222.00
17.	Additional commitments during Public Hearing	507.0
	Sub-Total (B)	**7582.0**
C. Environmental Management Plan		
18.	Strengthening of existing CAT Plan	60.0
19.	Greenbelt Development Plan	50.0
20.	Energy Conservation Measures	40.0
21.	Public Awareness Programme	50.0
22.	Disaster Management Plan	60.0
	Sub-Total (C)	**260.0**
D. Environmental Monitoring Programme		
22.	Implementation of Environmental Monitoring Programme during construction stage	124.0

S. No.	Item	Cost (Rs. lakh)
	Sub-Total (D)	**124.0**
	Grand Total (A+B+C+D)	**12582.72 lakh, say, Rs. 12 5.83 crore**
2. Recurring Expenses		
		Cost (Rs. Lakh/year)
1	Environmental Monitoring Programme during Operation phase	54.13
2	Educational Loan	88.0
	Total	**142.13**

12.1.3 The Proposal was earlier considered by the EAC in its 7th meeting held on 09.02.2024 wherein the EAC deferred the proposal as the project proponents and consultants failed to present their proposal effectively due to poor internet connectivity. Accordingly, the PP vide its reply dated 11.06.2024 re-submitted the proposal along with Interstate Clearance Letter, Executive Summary of Revised CEIA Report and Revised CEIA Report.

3.1.3. Deliberations by the committee in previous meetings

Date of EAC 1 :09/02/2024
Deliberations of EAC 1 :

The EAC during deliberations observed that the proposal is for grant of Environment Clearance to Pump Storage Project. During the appraisal process the consultant (M/s WAPCOS) had weak internet service and was not properly audible and slides were not visible. In addition the .kml file and the slides were not moving even after intervention by the f Ministry's NIC networking team. Therefore, the EAC expressed disappointment with the project proponent and consultant as the project proponents and consultants failed to present their proposals effectively.

It not only reflects poorly on their preparedness but also disrupts the evaluation process, potentially delaying project approvals and exacerbating environmental risks. The project proponents and consultants faced difficulties in presenting a crucial document, such as the approved letter obtained from the Odisha government related interstate issues. This document holds significance in demonstrating compliance with interstate regulations and ensuring transparency in environmental assessments.

The EAC desired that PP must come prepared for presentation by themselves and ensure proper internet facility and the connectivity in case of online appraisal of projects. The NABET accredited consultant (M/s WAPCOS) was also alerted to not repeat such situations in future.

The proposal is therefore ***deferred to the next meeting*** on the above lines.

3.1.4. Deliberations by the EAC in current meetings

12.1.4 The EAC during deliberations noted the following:

- The EAC deliberated on the information submitted and as presented in the meeting and observed that the proposal is for grant of Environmental Clearance to the project for Upper Sileru Open Loop Pumped Storage Project (1350 MW) in an area of 332.44 Ha at Village Valasagedda, Busikonda, Sub District Gudem Kotha Veedhi, District Alluri Sitharama Raju, Andhra Pradesh by M/s Andhra Pradesh Power Generation Corporation Limited.
- The project is listed at S.N.1(c) of the Schedule to the Environment Impact Assessment (EIA) Notification under category 'A' and are appraised at Central Level by Expert Appraisal Committee (EAC).

The Committee deliberated on the Public Hearing (PH) issues along with action plan submitted by the proponent to address the issues raised during the public hearing and found it satisfactory. The committee advised the PP to implement the PH action plan in a time bound manner. In view of presence of tribal population in the study area the EAC felt the need for establishing Skill Development Centres for locals, promotion of local tribal products through proper marketing for the same under supervision of Project Proponent. The Committee was also of the view that PP should bear the responsibility to provide amenities like setting up schools, solar panel, computer with internet facility in schools, pure drinking water facility for overall upliftment of tribal population.

3.1.5. Recommendation of EAC

Recommended

3.1.6. Details of Environment Conditions

3.1.6.1. Specific

Environmental management and Biodiversity conservation	
1.	The water of rainfall yield of self-catchment of the reservoir shall be released to downstream through body of dam/ barrage/ embankment etc.
2.	The water for filling of reservoir/ recoupment of evaporation and recirculation losses shall be met from a source other than the rainfall yield of catchment of non-perennial stream/ nallah.
3.	The Environmental Management Plan (EMP) shall be strictly adhered to as submitted in the EIA/EMP reports. The budgetary provisions for implementation of EMP, shall be fully utilized and not to be diverted to any other purpose. In case of revision of the project cost or due to price level change, the cost of EMP shall also be updated proportionately.
4.	The contract clause limiting the No. of vehicles used during excavation and transportation shall followed scrupulously and the same shall informed to the ministry.
5.	Ambient Air Quality Monitoring Stations for real time data to be installed at project site before commencement of the construction, shall be displayed at project site and its report to be submitted to IRO, MoEF&CC.
6.	No vehicle purchase shall be allowed from funds earmarked for implementation of Wildlife Conservation plan. Measures for minimizing the human–animal conflict specially for black bear and leopard be suitably incorporated in the wildlife conservation plan in consultation with State Forest Department.

7.	10000 plants shall be planted around the muck disposal area and the survival of plants shall be submitted with the 6 monthly compliance report.
8.	Watershed development plan shall be prepared in consultation with ICAR/expert Govt. institute and be implemented within 10 km radius of the project. Implementation status be submitted in the 6 monthly compliance report to the concerned regional office of the Ministry.
9.	Plant Nursery for Red Senders (Pterocarpus santalinus) shall be developed and 1000 Red Senders saplings/year shall be planted along the watershed areas within 10 km radius of the project.
Disaster Management	
1.	Stabilization of muck disposal sites using biological and engineering measures shall be taken up immediately to ensure that muck does not roll down the slopes and does not pollute the natural streams and water bodies in surrounding area. The plantation on muck disposal site with local species for restoration of ecology and environment of the project site area.
2.	Necessary control measures such as water sprinkling arrangements, and construction of paved roads leading to muck disposal sites etc. shall be taken up on priority to arrest fugitive dust at all the construction sites.
3.	Solid waste generated, especially plastic waste, etc. should not be disposed of as landfill material. It should be treated with scientific approach and recycled. Use of single-use plastics may be discouraged.
Socio-economic	
1.	RO plant shall be installed in the nearby 5 villages and the maintenance shall be done by the project Authorities.
2.	Solar panel be provided to the families living in rural areas within 10 km radius of project.
3.	School up to 12^{th} Standard shall be established to provide quality education for children from Tribal villages.
4.	The compliance of above conditions shall be monitored by IRO, MoEF&CC and regularly site visit once in year. The compliance report of IRO shall be regularly submitted to MoEF&CC.
5.	50 bed multi-speciality hospital shall be established to cater the need of tribal population/locals. The tribal population within 10 km radius of the project shall be given free of cost medical facility.
6.	Skill development Centre shall be established within 10 km radius of the project and regular training programmes for development and promotion of traditional art/products of tribal population.
7.	The area is ecologically fragile therefore Project Proponent shall ensure that safety measures as mentioned in the EMP shall be fully implemented.
Miscellaneous:	
1.	After 5 years of the commissioning of the project, a study shall be undertaken regarding impact of the project on the environment. The study shall be undertaken by an independent agency
2.	Bio-Gas plant (Deenn Bandhu Model of Bio-Gas) shall be installed in the Project affected area for Utilizing Cattle waste (Cow Dung) into renewable source of fuel.

3.	PP should establish in house (at project site) environment laboratory for measurement of environment parameter with respect to air quality and water (surface and ground). A dedicated team to oversee environment management shall be setup which should comprise of Environment Engineers, Laboratory chemist and staff for monitoring of air, water quality parameters on routine basis.
4.	PP shall procure construction material only from those Organizations having all valid legal/statutory clearances/permissions or necessary permission to be obtained for quarrying construction materials for the project as per the EIA Notification, 2006 and as amended thereof.
5.	An institutional mechanism to be developed to ensure the preference of jobs to PAFs and also a policy for preferential treatment for award of sundry works to the PAFs and their dependents.

3.1.6.2. Standard

1(c)	**River Valley/Irrigation projects**
Statutory compliance	
1.	The project proponent shall obtain forest clearance under the provisions of Forest (Conservation) Act, 1986, in case of the diversion of forest land for non-forest purpose involved in the project.
2.	The project proponent shall obtain clearance from the National Board for Wildlife, if applicable.
3.	The project proponent shall prepare a Site-Specific Conservation Plan & Wildlife Management Plan and approved by the Chief Wildlife Warden. The recommendations of the approved Site-Specific Conservation Plan / Wildlife Management Plan shall be implemented in consultation with the State Forest Department. The implementation report shall be furnished along with the six-monthly compliance report. (in case of the presence of Schedule-I species in the study area).
4.	The project proponent shall obtain Consent to Establish / Operate under the provisions of Air (Prevention & Control of Pollution) Act, 1981 and the Water (Prevention & Control of Pollution) Act, 1974 from the concerned State Pollution Control Board/ Committee.
5.	NOC shall be obtained from National Commission of Seismic Design Parameters (NCSDS) of CWC.
6.	Necessary approval of CEA shall be obtained for those projects having the project cost more than Rs. 1,000 crores.
Air quality monitoring and preservation	
1.	Regular monitoring of various environmental parameters viz., Water Quality, Ambient Air Quality and Noise levels as per the CPCB guidelines at designated locations shall be carried out on monthly basis and a detailed database of the same shall be prepared and recorded. This shall be used as a baseline data for post construction EIA / Monitoring purposes.
2.	Appropriate Air Pollution Control (APC) system shall be provided for all the dust generating points including fugitive dust from all vulnerable sources, so as to comply prescribed standards.
3.	Necessary control measures such as water sprinkling arrangements, etc. bet taken up to arrest fugitive dust at all the construction sites.
4.	Conjunctive use of surface water to be planned in the project to check water logging as well as to increase crops productivity. The field drains shall be connected with natural drainage system (if applicable).

5.	Remodelling of existing natural drains (link drains) and connecting them with irrigated land through constructed field drains, collector drains, etc. are to be ensured on priority basis (if applicable).
6.	Before impounding of the water, Cofferdams for both at the upstream and downstream are to be decommissioned as per EIA/EMP report so that once the project is commissioned; cofferdam should not create any adverse impact on water environment including the rock mass and muck used for the Cofferdam.
7.	As the reservoir will be acting as balancing reservoir and there would be fluctuation of water level during peaking period, efforts be made to reduce impact on aquatic life including impacts during spawning period both at the upstream and downstream of the project.
8.	Water depth sensors shall be installed at suitable locations to monitor e-flow. Hourly data to be collected and converted to discharge data. The Gauge and Discharge data in the form of Excel Sheet be submitted to the Regional Office, MoEF & CC and to the CWC on weekly basis.
9.	Mixed irrigation shall be practised and necessary awareness be given to all the farmers and trained in the use of such systems. Proper crops selection shall be carried out for making irrigation facility more effective (if applicable).
10.	On Farm Development (OFD) works like landscaping, land levelling, drainage facilities, field irrigation channels and farm roads, etc. should be taken up in phased manner prior to the start of irrigation in the entire command area. The Command Area Development Plan should be strictly implemented as proposed in the EIA/EMP report (if applicable).
Noise monitoring and prevention	
1.	All the equipment likely to generate high noise shall be appropriately enclosed or inbuilt noise enclosures be provided so as to meet the ambient noise standards as notified under the Noise Pollution (Regulation and Control) Rules, 2000, as amended in 2010 under the Environment Protection Act (EPA), 1986.
2.	The ambient noise levels should conform to the standards prescribed under E(P)A Rules, 1986 viz. 75 dB(A) during day time and 70 dB(A) during night time.
Catchment Area Treatment Plan	
1.	Catchment Area Treatment (CAT) Plan as proposed in the EIA/EMP report shall be implemented in consultation with the State Forest Department and shall be implemented in synchronization with the construction of the project.
Waste management	
1.	Muck disposal be carried out only in the approved and earmarked sites. The dumping sites shall be located sufficiently away from the HFL of the river. Efforts be made to reuse the muck for construction and other filling purposes and balanced be disposed of at the designated disposal sites. Once the muck disposal sites are inactive, proper treatment measures like both engineering and biological measures be carried out so that sites are stabilized quickly.
2.	Solid waste management should be planned in details. Land filling of plastic waste shall be avoided and instead be used for various purposes as envisaged in the EIA/EMP reports. Efforts be made to avoid one time use of plastics.
Green Belt and Wildlife Management	
1.	Based on the recommendation of Cummulative Impact Assessment and Carrying capacity study of river basin or as per the ToR conditions or minimum 15% of the average flow of four consecutive leanest months, whichever value is higher, shall be released as environmental flow.
2.	Detailed information on species composition particular to fish species from previous study/literature be

	inventoried and proper management plan shall be prepared for insitu conservation in the streams, tributaries of river and the main river itself for which adequate budget provision be made and followed strictly.
3.	Wildlife Conservation Plan approved by the Chief Wildlife Warden shall be implemented in consultation with the local State Forest Department.
4.	To enrich the habitat of the project site, plantation shall be raised as envisaged in the EIA/EMP report. Plantation to be developed along the periphery of the reservoir in multi-layers with local indigenous species in consultation with the local State Forest Department.
5.	Compensatory afforestation programme shall be implemented as per the plan approved.
6.	Fish ladder/pass as envisaged in the EIA/EMP report shall be provided for migration of fishes. Regular monitoring of this facility be carried out to ensure it effectiveness.
Public hearing and Human health issues	
1.	Resettlement & Rehabilitation plan be implemented in consultation with the State Govt. as approved by the State Govt.
2.	Budget provisions made for the community and social development plan including community welfare schemes shall be implemented in toto.
3.	Preventive measures viz. fuming and spraying of mosquito control shall be done in and around the labour colonies, affected villages, stagnated pools, etc. Provisions be made to not to create any stagnated pools to avoid creation of breeding grounds of the vector borne diseases.
4.	Provision shall be made for the housing of construction labour within the site with all necessary infrastructure and facilities such as fuel for cooking, mobile toilets, mobile STP, safe drinking water, medical health care, crèche etc. The housing may be in the form of temporary structures to be removed after the completion of the project.
5.	Labour force to be engaged for construction works shall be examined thoroughly and adequately treated before issuing them work permit. Medical facilities shall be provided at the construction sites.
Risk Mitigation and Disaster Management	
1.	Early Warning Telemetric system shall be installed in the upper catchment area of the project for advance intimation of flood forecast.
2.	Drilling and blasting shall be done only either by licensed explosive agent or by the proponent after obtaining required approvals from Competent Authorities.
3.	Emergency preparedness plan be made for any eventuality of the dam failure and shall be implemented as per the Disaster Management Plan.
4.	Stabilization of muck disposal sites using biological and engineering measures shall be taken up 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. The engineering measures for the muck disposal arrangements be evolved after carrying out required slope stability analysis.
5.	Catchment area treatment plan shall be prepared and sufficient fund shall be provided for afforestation, rim plantation, pasture development, nursery development.
Corporate Environment Responsibility	
1.	The project proponent shall comply with the provisions contained in this Ministry's OM vide F.No. 22-65/2017-

	IA.III dated 30th September, 2020, as applicable, regarding Corporate Environment Responsibility.
2.	Skill mapping be undertaken for the youths of the affected project area and based on the skill mapping, necessary trainings to the youths be provided for their long time livelihood generation
3.	The company shall have a well laid down environmental policy duly approve by the Board of Directors. The environmental policy should prescribe for standard operating procedures to have proper checks and balances and to bring into focus any infringements/deviation/violation of the environmental / forest / wildlife norms/ conditions. The company shall have defined system of reporting infringements / deviation/violation of the environmental / forest / wildlife norms/conditions and / or shareholders/ stake holders. The copy of the board resolution in this regard shall be submitted to the MoEF&CC as a part of six-monthly report.
4.	A separate Environmental Cell both at the project and company head quarter level, with qualified personnel shall be set up under the control of senior Executive, who will directly to the head of the organization.
5.	Action plan for implementing EMP and environmental conditions along with responsibility matrix of the company shall be prepared and shall be duly approved by competent authority. The year wise funds earmarked for environmental protection measures shall be kept in separate account and not to be diverted for any other purpose. Year wise progress of implementation of action plan shall be reported to the Ministry/Regional Office along with the Six Monthly Compliance Report.
6.	Post EIA and SIA be prepared for the project through a third party and evaluation report be submitted to the Ministry after five years of commissioning of the project.
7.	Multi Disciplinary Committee (MDC) be constituted with experts from Ecology. Forestry, Wildlife, Sociology. Soil Conservation, Fisheries, NGO, etc. to oversee implementation of various environmental safeguards proposed in EIA/EMP report during construction of the project. The monitoring report the Committee shall be uploaded in the website of the Company.
8.	Formation of Water User Association/Co-operative be made involment of the whole community be ensured for discipline use of available water for irrigation purposes
Miscellaneous	
1.	The project proponent shall make public the environmental clearance granted for their project along with the environmental conditions and safeguards at their cost by prominently advertising it at least in two local newspapers of the District or State, of which one shall be in the vernacular language within seven days and in addition this shall also be displayed in the project proponent's website permanently.
2.	The copies of the environmental clearance shall be submitted by the project proponents to the Heads of local bodies, Panchayats and Municipal Bodies in addition to the relevant offices of the Government who in turn has to display the same for 30 days from the date of receipt.
3.	The project proponent shall upload the status of compliance of the stipulated environment clearance conditions, including results of monitored data on their website and update the same on half-yearly basis.
4.	The project proponent shall submit six-monthly reports on the status of the compliance of the stipulated environmental conditions on the website of the ministry of Environment, Forest and Climate Change at environment clearance portal.
5.	The project proponent shall submit the environmental statement for each financial year in Form-V to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently and put on the website of the company.
6.	The project proponent shall inform the Regional Office as well as the Ministry, the date of financial closure and final approval of the project by the concerned authorities, commencing the land development work and start of production operation by the project.

7.	The project authorities must strictly adhere to the stipulations made by the State Pollution Control Board and the State Government.
8.	The project proponent shall abide by all the commitments and recommendations made in the EIA/EMP report, commitment made during Public Hearing and also that during their presentation to the Expert Appraisal Committee.
9.	No further expansion or modifications in the plant shall be carried out without prior approval of the Ministry of Environment, Forests and Climate Change (MoEF&CC).
10.	Concealing factual data or submission of false/fabricated data may result in revocation of this environmental clearance and attract action under the provisions of Environment (Protection) Act, 1986.
11.	The Ministry may revoke or suspend the clearance, if implementation of any of the above conditions is not satisfactory.
12.	The Ministry reserves the right to stipulate additional conditions if found necessary. The Company in a time bound manner shall implement these conditions.
13.	The Regional Office of this Ministry shall monitor compliance of the stipulated conditions. The project authorities should extend full cooperation to the officer (s) of the Regional Office by furnishing the requisite data / information/monitoring reports.
14.	The above conditions shall be enforced, inter-alia under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, the Air (Prevention & Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986, Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016 and the Public Liability Insurance Act, 1991 along with their amendments and Rules and any other orders passed by the Hon'ble Supreme Court of India / High Courts and any other Court of Law relating to the subject matter.
15.	Any appeal against this EC shall lie with the National Green Tribunal, if preferred, within a period of 30 days as prescribed under Section 16 of the National Green Tribunal Act, 2010.

3.2. Agenda Item No 2:

3.2.1. Details of the proposal

Jhariya Pumped Storage Project by **jhariya ANANTURJA PRIVATE LIMITED** located at **SONBHADRA,UTTAR PRADESH**			
Proposal For		Fresh ToR	
Proposal No	**File No**	**Submission Date**	**Activity (Schedule Item)**
IA/UP/RIV/471860/2024	J-12011/13/2024-IA-1(R)	02/07/2024	River Valley/Irrigation projects (1(c))

3.2.2. Project Salient Features

12.2.1: The proposal is for grant of Terms of References (ToR**)** to the project for Jhariya Pumped Storage Project (1620 MW), in an area of 333.97 ha. located at Village Badarwa, Tehsil Robertsganj, District Sonbhadra, Uttar Pradesh by M/s Jhariya Ananturja Private Limited.
12.2.2: 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:

S. No.	Reservoir Parameters	Upper Reservoir			
		Option-1A	**Option-1B**	**Option-2**	**Option-3**
1	Dam Top (m)	564	564	**569**	536
2	FRL (m)	560	560	**565**	531
3	MDDL (m)	543	543	**547**	513
4	Excavated bed Level (amsl)	542	542	**546**	511
5	Max. dam Height (m) above deepest ground	35	35	**33**	33
6	Weighted average dam height (m)	16.3	16.3	**19.8**	21.5
7	Length of Dam (m)	3585.1	3578.33	**2683.63**	2795
8	Area of reservoir (Ha)	94.25	94.78	**87.95**	99
9	Gross Storage Capacity (MCM)	13.42	13.5	**13.8**	13.8
10	Live Storage (MCM)	12.72	12.8	**12.41**	12.52
11	Total Excavation quantity (Lakh m^3)	51.35	51.71	**36.5**	38.6
12	Rock Excavation quantity (Lakh m^3)	31.2	34.64	**31.56**	25.9
13	Overburden soil (Lakh m^3)	7.8	8.66	**4.91**	12.7
14	Material requirement for Dam (Lakh m^3)	18.9	18.86	**20.01**	24

S. No.	Reservoir Parameters	Lower Reservoir				
		Option-1A	**Option-1B**	**Option-2**	**Option-3**	**Option-4**
1	Dam Top (m)	245	245	**243**	235	225
2	FRL (m)	240	241	**239**	230	220
3	MDDL (m)	223	223	**220**	212	199
4	Excavated bed Level (amsl)	222	222	**219**	210	197
5	Max. dam Height (m) above deepest ground	36	36	**34**	26	34

6	Weighted average dam height (m)	16.6	16.6	**16**	13	18.6
7	Length of Dam (m)	3428.1	3207.21	**3420**	2953	1265
8	Area of reservoir (Ha)	105.2	99.64	**94.92**	94.25	81.05
9	Gross Storage Capacity (MCM)	15.99	15.54	**16.45**	15.97	16.11
10	Live Storage (MCM)	15.15	14.76	**14.95**	14.45	14.55
11	Total Excavation quantity (Lakh m^3)	51	38.25	**46.6**	66.1	48.0
12	Rock Excavation quantity (Lakh m^3)	44.39	31.43	**38.71**	54.2	39.4
13	Overburden soil (Lakh m^3)	6.61	6.9	**7.86**	11.9	8.64
14	Material requirement for Dam (Lakh m^3)	18.73	17.52	**17.56**	10.65	8.5

EAC meeting/s	12th Meeting
Date of Meeting/s	18.07.2024
Date of earlier EAC meetings	Nil
Name of the Proposal	Jhariya Pumped Storage Project
Location (Including coordinates)	Lower Reservoir : 83°13'46.87"E; 24°30'11.50"N Upper Reservoir : 83°13'30.51"E; 24°31'18.33"N
Inter- state issue involved	No
Seismic zone	Zone-II
Category of the project	A
Provisions	
Capacity / Cultural command area (CCA)	1620 MW
Attracts the General Conditions (Yes/No)	Yes
Additional information (if any)	Nil
Powerhouse Installed Capacity	1620 MW

Generation of Electricity Annually	3404.0 MU
No. of Units	7 nos. (5X270 MW+2X135 MW)
Additional information (if any)	Nil
Cost of project	7374.57 Cr.
Total area of Project	333.97 ha
Height of Dam from River Bed (EL)	Lower Dam – 34.0 m Upper Dam – 33.0 m
Length of Tunnel/Channel	1583.97 m
Details of Submergence area	194.78 ha
Types of Waste and quantity of generation during construction/ Operation	Muck from excavation, solid waste from labour colony and construction waste
E-Flows for the Project	Not Applicable, as this is Off-Stream Closed Loop Pumped Storage Project (PSP)
Is Projects earlier studies in Cumulative Impact assessment & Carrying Capacity studies (CIA&CC) for River in which project located. If yes, then a) E-flow with TOR /Recommendation by b) EAC as per CIA&CC study of River Basin. If not the E-Flows maintain criteria for sustaining river ecosystem.	No

No. of proposed disposal area/ (type of land-Forest/Pvt. land)	90.0 ha Non-Forest Land
Muck Management Plan	Will be Provided in EIA/EMP report
Monitoring mechanism for Muck Disposal	Will be Provided in EIA/EMP report

Private Land	153.05 ha
Government land/Forest Land	180.92 ha
Submergence area/Reservoir area	194.78 ha
Land required for project components	139.19 ha
Additional information (if any)	Nil

Forest Land/ Protected Area/ Environmental Sensitivity Zone	**Yes/No**	**Details of Certificate / letter/ Remarks**

Reserve Forest/Protected Forest Land	--	Distance from nearest protected area (Kaimur WLS; UP) is 8.0 Km, however, proposed project is outside the notified ESZ bou ndary of the sanctuary.
National Park --- --		
Wildlife Sanctuary --- --		

Particulars	**Letter no. and date**
Certified EC compliance report (if applicable)	Not Applicable
Status of Stage- I FC	Yet to Apply
Additional detail (If any)	Nil
Is FRA (2006) done for FC-I	Yet to Apply

Particulars	**Details**
Details of consultant	M/s. R S Envirolink Technologies Pvt. Ltd. (RSET) (*N ABET* Accredited *Consultant Organization*) Certificate No : NABET/EIA/2225/RA0274 Validity : August 15, 2025 Contact Person : Mr. Ravinder Bhatia Name of Sector : River Valley and Hydroelectric Projects Category : A MoEF Schedule : I(C) Address : 403, Bestech Chambers, Block-B, Sushant Lok Phase I, S ector 43, Gurugram, Haryana - 1 22009 E-mail : ravi@rstechnologies.co.in Land Line : (0124) 4295383 Cellular : (+91) 9810136853
Project Benefits	
Status of other statutory clearances	Forest Clearance - Online application seeking fores t diversion for around 180.92 Ha after receipt of To R Approval. Alongside, other statutory clearances (as applicable) from State as well as Central govern ment will be obtained post completion of Detailed Project Report.
R&R details	Details shall be evaluated during EIA/EMP Studies
Additional detail (If any)	Nil

3.2.3. Deliberations by the committee in previous meetings

N/A

3.2.4. Deliberations by the EAC in current meetings

12.2.4 The EAC during deliberations noted the following: The EAC deliberated on the information submitted (Form 1, PFR, kml file, etc.) and as presented in the meeting and observed that the proposal is for grant of terms of reference to the project for Jhariya Pumped Storage Project (1620 MW), in an area of 333.97 ha. located at Village Badarwa, Tehsil Robertsganj, District Sonbhadra, Uttar Pradesh by M/s Jhariya Ananturja 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 total land requirement for the project is 333.97 Ha out of which forest land is 180.92 ha and Non-forest land is 153.05 ha. The application for Stage-I forest clearance is yet to be obtained. The EAC noted that more than Five PSP projects are proposed to be installed in close vicinity and source of water for all projects is Son River. In view of cascade development of PSP projects in the region the EAC was concerned about its impact on topography and water availability for sustaining the river eco-system, as the SON River is not a snow feed river it receives water from its catchment during monsoon season only, if the water channels/ rivulets available in the catchment gets disturbed due to excessive development of such projects, the sustainability of the river may be adversely affected. Flow health assessment and cumulative impact assessment & carrying capacity study of Son River is the utmost requirement for taking up Pumped Storage Projects in the river basin.

3.2.5. Recommendation of EAC

Recommended

3.2.6. Details of Terms of Reference

3.2.6.1. Specific

Environmental Management and Biodiversity Conservation	
1.	Forest Division of the Ministry and State Government while appraising Forest Clearance, shall take into account the richness of biodiversity and pristine forest area to take appropriate decision.
2.	Explore the possibilities for reducing the Forest land requirement. The application for obtaining Stage I FC for 180.92 Ha of forest land involved in the project shall be submitted.
3.	Certificate and certified map from Chief Wildlife Warden shall be submitted mentioning that project boundary is not falling in any Ecological Sensitive Area, Wildlife Sanctuary/Tiger/elephant corridor/Critically polluted area within 10 km of Project site.
4.	PP shall submit the detailed plan for filling the reservoir in 2 years for generating envisaged capacity with excess monsoon water only.
5.	No Objection Certificate from State of Jharkhand and Bihar as there may be genuine concern of downstream consumers to avoid scarcity of water to consumers. The availability of water in the river shall be submitted by Project Proponent certified by the Central Water Commission and State Water Resources Department.
6.	Transportation Plan for transporting construction materials shall be submitted. Separate chapter for risk assessment of such transportation through/within the Wildlife Sanctuary shall be included in the

	EIA report.
7.	Environmental Cost Benefit Analysis shall be done in terms of loss of Forest ecosystem due to diversion of Forest land/loss of biodiversity, water availability, water uses for generation of hydro power and Ecological flows.
8.	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.
9.	The longitudinal connectivity/Free flowing sketch be provided in the EIA/EMP report. Presence of any critical mineral zone in the proposed area be clarified from GSI.
10.	Quantitative values of Impact modelling of environmental parameters shall be submitted for during construction and operation. Also, mitigation measures shall be submitted in terms of construction and operation phase.
11.	Conducting site specific ecological study with respect to riverine ecology focus on fishes diversity, fish migration, habitat and aquatic biota due to construction PSP. Impact assessment on the fish diversity based on the hydrological alteration at the water drawing sources Sone River shall be studied.
12.	Cumulative Impact of project on carrying capacity and sustainability of Reservoir/ Sone River /nala of catchment area / due to tapping of water for filling reservoir.
13.	Action plan for survival or diversion of the rivulets/stream leading to join Sone river shall be submitted.
14.	Impact zone decided prior to base line data generation and accordingly, sampling location shall be finalized. Baseline data as mentioned in Standard ToR shall be collected for preparation of EIA/ EMP report along with soil characteristics which shall be studied at minimum 10 locations. The ground water level at 10 locations shall be measured in project area in all three seasons.
15.	A study shall be carried out on impact of project activity on the aquatic and terrestrial ecosystem, within project area classifying the impact zones (highly impact/low impact zone) based on seasonal variations and covering the aspects related to impacts on aquatic ecosystem/ primary productivity due to quantity of water to be lifted for power generation and thermal stratification. Accordingly, Environment Management plan shall be prepared.
16.	Reservoir/ River banks protection plan all along the submergence need to be prepared and incorporated in EIA/ EMP.
17.	Scope of watershed development in the 10 km radius of the project shall be studied in consultation with Govt. institutions/ Indian Council of Agriculture Research (ICAR)and accordingly a detailed Water Shed Development Plan shall be prepared and incorporated in EIA/ EMP report.
18.	The project area should not come up on any critical mineral zone to be verified by GSI/NMDC.
19.	Any archaeological sites in the vicinity of the project, if any, then it shall be certified by ASI. No mineral zone on the proposed site be certified by Geological Survey of India or any other concerned Government Organization.
Socio-economic Study	
1.	Declaration by the project proponent by way of affidavit that "No" Inter-state issue/ policy issue is

	involved with any State in the project.
2.	All the tasks including conducting public hearing shall be done as per the provisions of EIA Notification, 2006 and as amended from time to time. Public hearing issues raised and compliance of the same shall be incorporated in the EIA/ EMP report in the relevant chapter.
3.	PP shall submit the credible documents to show the status of land acquisition w.r.t project site from/through the concerned State Government as required under Ministry's OM dated 7th October, 2014 for the project land to be acquired.
4.	Land acquired for the project shall be suitably compensated in accordance with the law of the land with the prevailing guidelines. Private land shall be acquired as per provisions of Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013.
5.	Budget earmarked for R&R, CSR shall not include in the cost of EMP and compliance of issues raised during Public Hearing.
Muck Management/ Disaster 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.	PP shall submit the proposal of EAC and seek approval of CEA/CWC for DPR, with a distance of 100 mts from HFL to avoid future damage due to flood. The data and distance of HFL shall be certified by concerned State Government and shall be submitting grant submitting the proposal of grant of EC.
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 submit.
5.	Undertaking need to submitted on affidavit that regarding no activities has been yet started on the project site and water allocated to this scheme shall not be diverted to other purpose.
6.	Detailed plan to restore wider roads and convert them into narrow upto 10m after construction of the project. 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.
7.	As per Ministry's OM dated 1st August, 2013, PP shall submit application to obtain prior approval of Central Government under the Forest Conservation Act, 1980 for diversion of forest land required for such projects will be submitted as soon as the actual extent of forest land required for the project is known to the project proponent, and in case, within 6 months of issuance of ToR. However, no proposal will be put up before EAC without submission of application for forest clearance, wherever applicable.
8.	Detailed report on cumulative effect of multiple projects already proposed within the region on the same river.

3.2.6.2. Standard

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

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

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

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

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

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

0.	(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.
1	Water pollution due to disposal of sewage

0.	
11.	Water pollution from labour colonies/ camps and washing equipment.
12.	Adverse impact on land stability, catchment of soil erosion, reservoir sedimentation and spring flow (if any) (a) due to considerable road construction / widening activity (b) interference of reservoir with the inflowing stream (c) blasting for commissioning of HRT, TRT and some other structures.
13.	Changes in land use / land cover and drainage pattern
14.	Immigration of labour population
15.	Quarrying operation and muck disposal
16.	Changes in land quality including effects of waste disposal
17.	River bank and their stability
18.	Impact due to submergence.
19.	Impact on forests, flora, fauna including wildlife, migratory avi-fauna, rare and endangered species, medicinal plants etc.
20.	Pressure on existing natural resources
21.	Deforestation and disturbance to wildlife, habitat fragmentation and wild animal's migratory corridors
22.	Compensatory afforestation-identification of suitable native tree species for compensatory afforestation and green belt.
23.	Impact on fish migration and habitat degradation due to decreased flow of water
24.	Impact on breeding and nesting grounds of animals and fish.
25.	Impact on local community including demographic profile.
26.	Impact on socio-economic status
27.	Impact on economic status.
28.	Impact on human health due to water / vector borne disease

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

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

3.3. Agenda Item No 3:

3.3.1. Details of the proposal

Rouni Pumped Storage Hydro-electric Project (2100 MW) by **CHHATTISGARH STATE POWER GENERATI ON COMPANY LIMITED** located at **JASHPUR,CHHATTISGARH**			
Proposal For		Fresh ToR	
Proposal No	**File No**	**Submission Date**	**Activity (Schedule Item)**
IA/CG/RIV/460323/2024	J-12011/10/2024-IA-I(R)	31/01/2024	River Valley/Irrigation projects (1(c))

3.3.2. Project Salient Features

12.3.1: The proposal is for grant of Terms of References (TOR) Rouni Open Loop Pumped Storage Project (2100 MW) in an area of 370 ha at Village Bhadikona, Chhichhli and Rajpuri R F, Sub-district Bagicha, District Jashpur, Chhattisgarh by M/s Chhattisgarh State Power Generation Company Limited.

iv. The details of the project components are as follows:

v. The Rouni Pumped Storage Project envisages construction of Upper dam, intake, Head race tunnel, pressure tunnel, penstock, powerhouse, transformer hall, tail race tunnel, outlet and Lower dam.

vi. **Land requirement:**

Forest Land	74.14 Hectares
Submergence area/Reservoir area	216.54 Hectares
Land required for project components	327.68 Hectares (Say 328 Ha)

Item	**Estimated Cost (₹ Crores)**
Civil Works	4064.69
Electro-mechanical Works	3579.18
Total	**7643.87**

In Rouni site approx. 125 - 140 households are affected in the project area as per the preliminary study and the details are as below.

1. U/R – 50-55 Households
2. L/R – 45-50 Households
3. WCS & PH – 30-35 Households

- **Project Details:**

Name of the Proposal	Rouni Open Loop Pumped Storage Hydro-el ectric Project (2100 MW)
Location (Including coordinates)	Near Bhadikona, Rouni, Chhichhli and Rajp

	uri village of Bagicha Tehsil, Jashpur district of Chhattisgarh, India The Upper Reservoir falls in 23°3'16.01"N and 83°37'3.92"E and Lower Reservoir falls in 23°1'1.78"N and 83°38'11.86"E respectively.
Inter- state issue involved	No
Seismic zone	Zone-II

- **Category Details:**

Category of the project	A
Provisions	-
Capacity / Cultural command area (CCA)	2100 MW
Attracts the General Conditions (Yes/No)	No
Additional information (if any)	-

- **Electricity generation capacity:**

Powerhouse Installed Capacity	6 units of 350 MW each
Generation	4366.5 GW

of Electricity Annually	h
No. of Units	6
Additional information (if any)	-

- **ToR/EC Details:**

Cost of project	Rs. 7643.87 Crores
Total area of Project	327.68 Hectares (Say 328 Ha)
(Height of Dam from deepest Foundation level (EL))	Upper dam- 22m
Length of Tunnel/Channel	3159 m

Details of Submergence area	216.54 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	E flows will be governed from the proposed Lower dam planned on Dorki Nalla
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

- **Muck Management Details:**

No. of proposed disposal area/ (type of land- Forest/ Pvt. land)	25 hectares (approx.) non-forest land
Muck Management Plan	Will be prepared during DPR
Monitoring mechanism for Muck Disposal	Will be prepared during DPR

- **Land Area Breakup:**

Private land/Non Forest land	253.54 Hectares (Non Forest Land)
Government land/Forest Land	74.14 Hectares (Forest Land)
Submergence area/Reservoir area	216.54 Hectares
Land required for project components	327.68 Hectares (Say 328 Ha)
Additional information (if any)	-

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

Forest Land/ Protected Area/ Environmental Sensitivity Zone	Yes/No	Details of Certificate/letter/Remarks
Reserve Forest/Protected Forest Land	(Yes)	**Total Forest Land – 74.14 Ha** *(Protected Forest Land – **53.43** Ha* *Reserved Forest Land – **20.71** Ha)*
National Park	No	
Wildlife Sanctuary	No	

- **Court Case Details: Nil**
- **Miscellaneous:**

Particulars	Details
Details of consultant	WAPCOS Limited
Project Benefits	Hydro-electric power and Employment generat ion
Status of other statutory clearances	-
R&R details	Yes (Total 125 - 140 Households) Upper Reservoir: 50-55 Households Lower Reservoir: 45-50 Households Water Conductor System & Power House: 30-3 5 Households

12.3.3 The Proposal was earlier considered by the EAC in its 7th meeting held on 09.02.2024 wherein the EAC deferred the proposal seeking additional information, accordingly PP vide its reply dated 14.06.2024 on Parivesh submitted the following:

Query 1: The project proponent shall explore any alternate source of water nearer to the site as Dorki Nallah is not a perennial river or alternative site specifically for lower reservoir. Also submit the Seasonal hydrograph of Dorki Nallah to assess the make-up water during lean season.

Reply:

A site visit has been carried out from 27th-30th April 2024 to examine/study the project area. It is confirmed that Dorki Nallah, a tributary of the Ib River, is the water source in the project area. The river map of the Jashpur district has been submitted.

As no other water source except the Dorki Nala is available in the vicinity of the project area, hence the Lower reservoir is proposed on the Dorki Nala itself. The Two (02) alternative sites for the Lower reservoir have been identified in the Dorki Nallah reach and named as Alternative- 5 & 6. Overall 06 no alternatives have been studied and has been submitted.

Seasonal Hydrograph of Dorki Nallah

No observed Gauge and discharge data in and around the project or in the d/s of the proposed Lower dam is available for the Dorki nalla.

The nearest G&D site is Thettanagar on Ib River after the confluence of the Maini River with the Ib River, which is approximately 70 km d/s of proposed lower dam site.

In the absence of any observed data at Dorki nalla, an attempt was made to prepare an average monthly discharge curve based on the IMD gridded rainfall data for the project catchment using the runoff factor method.

As per the Hydrological studies:

The Average flows in monsoon season (Jun-Oct.)

Maximum = 64 cumec in June (7.1 MCM)

Minimum = 11.7 cumec in Oct.(1.3 MCM)

The Average flows in the Lean season (Nov-May)

Maximum = 4.5 cumec in May(0.5 MCM)

Minimum = 1.1 cumec in Dec. (0.1 MCM)

The catchment area of the Proposed Rouni PSP at the proposed Lower Dam site is 47.22 sq.km and the average monsoon yield has been estimated as 25 MCM.

The one-time filling requirements of the Upper & Lower Reservoirs of the proposed Rouni PSP scheme is 19.87 MCM only. The filling of reservoirs will be considered only in the monsoon season.

Provision of Environmental flow release shall be kept as per the prevailing Guidelines of E-flow, i.e 30% for Monsoon Months to cater downstream water requirement.

Query 2: PP shall resubmit the proposal with revised layout after minimizing the forest land for the proposed project.

Reply:

- The possible Six (06) nos of alternatives for both the dam sites have been studied keeping in account the minimal utilization of Forest Land, and based on that the project Layout has been proposed/selected to go-ahead with.
- The total land requirement for the proposed layout is 327.68 Ha (Including Surface & Underground). The forest boundary has also been superimposed on the Project Layout and has been submitted.
- It is clearly marked that 74.14 Ha land is forest land, rest is Private/ Government Land. Out of 74.14 Ha of forest land, 44.5 Ha land comes under submergence of both reservoir which will get affected. The balance 29.64 Ha of forest land is falling in Underground structures (HRT, TRT, MAT & CAT). This is notional.
- The Forest land is 22.8% of the total Land requirement for the Proposed Rouni PSP Scheme.

Query 3: Finalize the site of Muck disposal outside the forest area and explore the possibility for management of muck in any closed nearby coal mine (if any).

Reply: There is no Coal mine facility either closed or operating is available in the vicinity of the project area, however, the muck disposal sites have been identified and the same has been proposed outside the forest area and has been submitted.

Query 4: PP shall submit MoU signed with State department for setting up the proposed project and availability of water for the project.

Reply: The Energy Dept. of Govt. of Chhattisgarh has issued the order to PP for preparation of DPR & also PP is a Nodal Agency for Identification, survey, investigation & development of PSP within the state. Document has been submitted.

Query 5: Secondary data of presence/occurrence of wildlife in the in consultation in forest department and local people shall be provided.

Reply: A site visit of the project area was carried out in the last week of April, 2024. The secondary data for the project area has been collected and has been submitted.

It is pertinent to mention that there is no Wildlife Sanctuaries, Biosphere Reserve, National Parks, Wild Life Corridors etc…. in the proposed project sites.

3.3.3. Deliberations by the committee in previous meetings

Date of EAC 1 :09/02/2024

Deliberations of EAC 1 :

The EAC during deliberations noted the following:

- The EAC deliberated on the information submitted (Form 1, PFR, kml file, etc.) and as presented
- The project/activity is covered under Category A of item 1 (c) 'River Valley & Hydroelectric proj
- The EAC noted that the upper reservoir will be constructed away from any river/stream/nallah wh
- During the meeting the EAC sought clarification from the project proponent regarding alternative
- Project proponent has also not yet finalized the muck disposal site. The committee suggested to se
- The EAC further observed that the project involves 75 Ha of forest land and as per the .Kml file a
- The committee suggested to carry out alternate site analysis on the basis of lowest sensitive in ter

The EAC after detailed deliberation on the information submitted and as presented observed that proposed source of water is non-perennial and the availability of water for other users of this stream is required to be known. Also, during lean season the makeup water or water loss during operation of project is to be assessed. PP may explore the alternate source of water and explore other sites particularly for lower reservoir for sustenance of the project. Further it was observed as per the .Kml file and photographs that the location of the project covers very high density of forest. It was opined that MoU or any kind of agreement with State Government is required to substantiate the site allocation to instant Project Proponent. Accordingly, EAC desired that PP shall submit the further details on below mentioned observation:

3.3.4. Deliberations by the EAC in current meetings

12.3.4 The EAC during deliberations noted the following:
The EAC deliberated on the information submitted (Form 1, PFR, kml file, etc.) and as presented in the meeting and observed that the proposal is for grant of terms of reference to the project for Rouni Open Loop Pumped Storage Project (2100 MW) in an area of 370 ha at Village Bhadikona, Chhichhli and Rajpuri R F, Sub-district Bagicha, District Jashpur, Chhattisgarh by M/s Chhattisgarh State Power Generation Company 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.

3.3.5. Recommendation of EAC

Recommended

3.3.6. Details of Terms of Reference

3.3.6.1. Specific

Environmental Management and Biodiversity Conservation	
1.	Explore the possibilities for reducing the Forest land requirement. The application for obtaining Stage I FC for 74.14 Ha of forest land involved in the project shall be submitted.
2.	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.
3.	PP shall submit the detail plan for filling the reservoir in 2 years for generating envisaged capacity with excess monsoon water only.
4.	No transportation of raw materials shall be done through/within the Wildlife Sanctuary prior to the grant of State Government/ Forest Department/Wildlife Department. Accordingly, transportation plan shall be submitted by PP.
5.	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.
6.	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.
7.	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.
8.	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.
9.	Conducting site specific ecological study with respect to riverine ecology focus on fishes diversity, fish migration, habitat and aquatic biota due to construction PSP. Impact assessment on the fish

	diversity based on the hydrological alteration at the water drawing sources shall be studied.
10.	Impact of project on downstream users utilizing water of Dorki nallah shall be incorporated in EIA/EMP along with mitigation measures.
11.	Action plan for survival and diversion of the Dorki Nalla shall be submitted.
12.	Impact zone decided prior to base line data generation and accordingly, sampling location shall be finalized. Baseline data as mentioned in Standard ToR shall be collected for preparation of EIA/ EMP report along with soil characteristics which shall be studied at minimum 10 locations. The ground water level at 10 locations shall be measured in project area in all three seasons.
13.	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.
14.	Reservoir/ River banks protection plan all along the submergence need to be prepared and incorporated in EIA/ EMP.
15.	Scope of watershed development in the 10 km radius of the project shall be studied in consultation with Govt. institutions/ Indian Council of Agriculture Research (ICAR)and accordingly a detailed Water Shed Development Plan shall be prepared and incorporated in EIA/ EMP report.
16.	The project area should not come up on any critical mineral zone to be verified by GSI/NMDC.
17.	Any archaeological sites in the vicinity of the project, if any, then it shall be certified by ASI. No mineral zone on the proposed site be certified by Geological Survey of India or any other concerned Government Organization.
Socio-economic Study	
1.	All the tasks including conducting public hearing shall be done as per the provisions of EIA Notification, 2006 and as amended from time to time. Public hearing issues raised and compliance of the same shall be incorporated in the EIA/ EMP report in the relevant chapter.
2.	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.
3.	Land acquired for the project shall be suitably compensated in accordance with the law of the land with the prevailing guidelines. Private land shall be acquired as per provisions of Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013.
4.	Budget earmarked for R&R, CSR shall not include in the cost of EMP and compliance of issues raised during Public Hearing.
Muck Management/ Disaster Management	
1.	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.

2.	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.
3.	Restoration plan for construction area including dumping site of excavated materials by levelling, filling up of burrow pits, landscaping etc.
Disaster Management	
1.	PP shall submit the proposal of EAC and seek approval of CEA/CWC for DPR, with a distance of 100 mts from HFL to avoid future damage due to flood. The data and distance of HFL shall be certified by concerned State Government and shall be submitting grant submitting the proposal of grant of EC.
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 submit.
5.	Undertaking need to submitted on affidavit that regarding no activities has been yet started on the project site and water allocated to this scheme shall not be diverted to other purpose.
6.	Detailed plan to restore wider roads and convert them into narrow upto 10m after construction of the project. 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.
7.	As per Ministry's OM dated 1st August, 2013, PP shall submit application to obtain prior approval of Central Government under the Forest Conservation Act, 1980 for diversion of forest land required for such projects will be submitted as soon as the actual extent of forest land required for the project is known to the project proponent, and in case, within 6 months of issuance of ToR. However, no proposal will be put up before EAC without submission of application for forest clearance, wherever applicable.
8.	Detailed report on cumulative effect of multiple projects already proposed within the region on the same river.

3.3.6.2. Standard

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

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

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

	of possible r.e.t. species form the said area is developed, species specific methodologies should be adopted to ascertain their presence in the study area which would be far more conclusive as compared to the conventional sampling. If the need be, modern methods like camera trapping can be resorted to, particularly for areas in the eastern Himalayas and for secretive/nocturnal species. A detailed listing of the literature referred to, for developing lists of r.e.t. species should be provided in the EIA reports.
4.	The R.E.T. species referred to in this point should include species listed in Schedule I and II of Wildlife (Protection) Act, 1972 and those listed in the red data books (BSI, ZSI and IUCN).
Components of the EIA Study: Various aspects to be studied and provided in the EIA/EMP report are as 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.
6	Special attention has to be given to vulnerable groups like women, aged persons etc. and to any ethnic/indigenous

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

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

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

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

3.4. Agenda Item No 4:

3.4.1. Details of the proposal

Panaura Pumped Storage Project by **ADANI GREEN ENERGY LIMITED** located at **SONBHADRA,UTTAR P RADESH**			
Proposal For		Fresh ToR	
Proposal No	**File No**	**Submission Date**	**Activity (Schedule Item)**
IA/UP/RIV/472012/2024	J-12011/14/2024-IA-I(R)	29/05/2024	River Valley/Irrigation projects (1(c))

3.4.2. Project Salient Features

12.4.1: The proposal is for grant of Terms of References (ToR) to the project for Panaura Pumped Storage Project (1500 MW), in an area of 236.5 ha. located at Village Soman, Argarh. Chichli etc Tehsil Robertsganj, District Sonbhadra, Uttar Pradesh by M/s Adani Green Energy Limited.

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

i. The Panaura Pumped Storage Hydro Project (1500 MW) in an area of 236.50 ha located at Village Soma, Argur, Chananee etc., Tehsil Robertsganj, District Sonbhadra, Uttar Pradesh by M/s Adani Green Energy Limited.

ii. It is a standalone scheme with two new Greenfield reservoirs and utilizes storage between the two proposed reservoirs for energy generation. The scheme is envisaged to meet the peak demand of about 6.0 hours with an estimated annual energy generation of 3121 MU. Off-peak pumping hours are estimated as 6.95 hours with annual pumping energy of 3946 MU. The cycle efficiency of the project is 79%.

iii. The proposed Panaura PSP is planned an ‘Off stream closed loop’ scheme. Major source of water for

this pumped storage scheme will be the Sone River. A one-time allocation /requirement of 13.22MCM are required for the cyclic operation of generation cum pumping of the PSP.

iv. The geographical co-ordinates of the proposed upper reservoir are at Latitude 24°32'50.58"N and Longitude is 83°24'24.84"E. The catchment area up to upper dam site is estimated to be about 1.0 km2. The geographical co-ordinates of the proposed upper reservoir are at Latitude at 24°31'30.04"N and Longitude is 83°24'40.03"E. The catchment area up to the existing lower dam is about 7.0 km2.

v. The Panaura Pumped Storage Project envisages construction of two artificial reservoirs near Panaura, Shoma, Argur, Chananee & Chichlik Villages in Sonbhadra district, Uttar Pradesh.

vi. **Land requirement:** The total land requirement for the proposed project is about 236.5ha; out of which about 230.25ha is forest land and remaining about 6.25 Ha is non-forest area.

vii. **Water requirement:** Panaura PSP (1500 MW) will require 13.22 MCM for initial reservoir filling and thereafter ~ 1.52 MCM per year will be required on annual basis from Sone River for restoring the storage capacity lost due to evaporation.

viii. **Project Cost:** The estimated project cost is Rs 7463.64 crore. Total capital cost earmarked towards environmental pollution control measures will be worked out during EIA study as well as the Recurring cost (operation and maintenance).

ix. **Project Benefit:** Total Employment will be 1200 people direct & 200 persons indirect.

x. **Environmental Sensitive area**: Kaimur WLS (Bihar) is located about 6.90km, however, proposed project is outside the notified ESZ boundary of the sanctuary. River/water body, Sone River is flowing at the aerial distance of 0.5km in west to east direction.

xi. MoU signed with State Government on 16.05.2024 MoU no. 24/REN/0000028126.

xii. Alternative Studies: 4 alternative layouts have been prepared and compared for development of PSP. Alternative study is as under:

Reservoir ID	Reservoir Name	FRL	MDDL	Gross Storage	Dam Length	Dam Height	Remarks
		(RL in m)	(RL in m)	(MCM)	(m)	(m)	
1	R-1	550	533	8.10	1550	24	Higher storage capacity, minimal/no Habitations, lesser dam height
2	R-2	225	184	8.46	1000	48	Higher storage capacity, minimal/no Habitations
3	R-3	570	546	5.54	750	33	Lesser Gross storage, Reservoir area may overlap with other PSP developer
4	R-4	198	184	7.79	500	21	Reservoir area over lapping with other PSP developer
5	R-5	544	530	8.79	950	19	Reservoir area over lapping with other

							PSP developer, Habitations in submergence area

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

1	**EAC MEETING DETAILS**		
i	EAC meeting/s	:	12TH EAC Meeting
ii	Date of Meeting/s	:	18th July 2024
iii	Date of earlier EAC meetings	:	Not Applicable
2	**PROJECT DETAILS**		
i	Name of the Proposal	:	Panaura Pumped Storage Project (1500MW)
ii	Location (including coordinates)	:	**Located at Village Soma, Argur, Chananee etc., Tehsil Robertsganj, District Sonbhadra, Uttar Pradesh** The proposed project involves creation of upper reservoir are at longitude 83°24'24.84"E and latitude is 24°32'50.58"N and that of lower reservoir are at longitude 83°24'40.03"E and latitude 24°31'30.04"N Water will be sourced from Sone River in Sonbhadra district.
iii	Interstate Issue	:	No
iv	Seismic Zone	:	Zone-III
3	**CATEGORY DETAILS**		
i	Category of the project	:	A
ii	Provisions	:	-
iii	Capacity	:	1500MW
iv	Attracts the General Conditions (Yes/No)	:	Yes

v	Additional Information if any	:	No
4	**ELECTRICITY GENERATION AND CAPACITY**		
i	Powerhouse Installed Capacity	:	1500 MW
ii	Generation of Electricity Annually	:	3121 MU
iii	No. of Units	:	6 nos. (4 X 300 MW + 2 X 150 MW)
iv	Additional information (if any)	:	Nil
5	**TOR/EC DETAILS**		
i	Cost of project	:	INR 7463.64crore
ii	Total area of Project	:	236.5 ha
iii	Height of Dam from Riverbed (EL)	:	Lower Dam – 47m, Upper Dam – 27m
iv	Length of Tunnel/Channel	:	3181m
v	Details of Submergence area	:	190ha
vi	Types of Waste and quantity of generation during construction/ Operation	:	Muck from excavation, solid waste from labour colony and construction waste.
vii	E-Flows for the Project	:	Not Applicable, as this is Off-Stream closed Loop Pumped Storage Project (PSP)
viii	Is Projects earlier studies in Cumulative Impact assessment & Carrying Capacity studies (CIA&CC) for River in which project located. If yes, the	:	No

a	E-flow with TOR /Recommendation by EAC as per CIA&CC study of River Basin.	:	Not Applicable
b	If not the E-Flows maintain criteria for sustaining river ecosystem.	:	Not Applicable
6	**MUCK MANAGEMENT DETAILS**		
I	No. of proposed disposal area/ (type of land-Forest/Pvt. land)	:	15.0ha Private Land
Ii	Muck Management Plan	:	Will be Provided in EIA/EMP report
Iii	Monitoring mechanism for Muck Disposal	:	Will be Provided in EIA/EMP report
7	**LAND AREA BREAK-UP**		
I	Private Land	:	6.25ha
Ii	Government land/Forest Land	:	230.25ha
Iii	Submergence area/Reservoir area	:	190.0ha
Iv	Land required for project components	:	46.50ha
V	Additional information (if any)	:	Nil

8	**PRESENCE OF ENVIRONMENTALLY SENSITIVE AREAS IN THE STUDY AREA**		
S. no	**Forest Land/ Protected Area/ Environmental Sensitivity Zone**	**Yes/ NO**	**Details of Certificate/letter/Remarks**

I	Reserve Forest/PF Land	NO	Distance from nearest protected area (Kaimur WLS; Bihar) is 6.90 Km, however, proposed pr oject is outside the notified ESZ boundary of th e sanctuary.
ii	National Park	NO	
iii	Wildlife Sanctuary	NO	
9	**COURT CASE DETAILS**		
i	Court Case	:	Nil
ii	Additional Information if any	:	Nil
10	**AFFIDAVIT/UNDERTAKING DETAILS**		
i	Affidavit/Undertaking	:	Enclosed
ii	Additional information (if any)	:	Nil
11	**PREVIOUS EC COMPLIANCE AND NECESSARY APPROVALS**		
i	Certified EC compliance report (if applicable)	:	Not Applicable
ii	Status of Stage- I FC	:	Yet to Apply
iii	Additional detail (If any)	:	Nil
iv	Is FRA (2006) done for FC-I		Not Applicable
12	**MISCELLANEOUS**		
i.	**Details of Consultant**		
	Name of Consultant	:	M/s. RS Envirolink Technologies Pvt. Ltd. (RSE T) (NABET Accredited Consultant Organization)
	Certificate No	:	NABET/EIA/2225/RA0274
	Validity	:	August 15, 2025
	Contact Person	:	Mr. Ravinder Bhatia
	Name of Sector	:	River Valley and Hydroelectric Projects

	Category	:	A
	MoEF&CC Schedule	:	1(c)
ii	**Project Benefits**	**:**	Pumped storage hydropower is a modified use of conventional hydropower technology to store and manage energy or electricity by moving water between an upper and lower reservoir. Currently, pumped storage round-trip or cycle energy efficiencies exceed 80%, comparing favorably to other energy storage technologies and thermal technologies. This effectively shifts, stores, and reuses energy generated until there is corresponding demand for system reserves and variable energy integration. This shifting can also occur to avoid transmission congestion periods, to help more efficiently manage transmission grid, and to avoid potential interruptions to energy supply. This is important because many of the renewable energy resources being developed (e.g., wind and solar) are generated at times of low demand and off-peak energy demand periods are still being met with fossil fuel resources, often at inefficient performance levels that increase the release of greenhouse gas emissions. Further, pumped storage projects are critical to the national economy and overall energy reliability because it's: o Least expensive source of electricity, not requiring fossil fuel for generation o An emission-free renewable source o Balancing grid for demand driven variations o Balancing generation driven variations o Voltage support and grid stability Apart from this, proposed PSP will also benefit the local community by creating employment opportunities and will result in upliftment of livelihood and socio-economic conditions.

3.4.3. Deliberations by the committee in previous meetings

N/A

3.4.4. Deliberations by the EAC in current meetings

12.4.3 The EAC during deliberations noted the following

The EAC deliberated on the information submitted (Form 1, PFR, kml file, etc.) and as presented in the meeting and observed that the proposal is for grant of terms of reference to the project for Panaura Pumped Storage Project (1500 MW), in an area of 236.5 ha. located at Village Soman, Argarh. Chichli etc Tehsil Robertsganj, District Sonbhadra, Uttar Pradesh by M/s Adani Green Energy 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 total land requirement for the proposed project is about 236.5ha; out of which about 230.25ha is forest land and remaining about 6.25 Ha is non-forest area. The application for Stage-I forest clearance is yet to be obtained. The EAC noted that more than Five PSP projects are proposed to be installed in close vicinity and source of water for all projects is Son River. In view of cascade development of PSP projects in the region the EAC was concerned about its impact on topography and water availability for sustaining the river eco-system, as the SON River is not a snow feed river it receives water from its catchment during monsoon season only, if the water channels/ rivulets available in the catchment gets disturbed due to excessive development of such projects, the sustainability of the river may be adversely affected. Flow health assessment and cumulative impact assessment & carrying capacity study of Son River is the utmost requirement before taking up Pumped Storage Projects in the river basin.

3.4.5. Recommendation of EAC

Recommended

3.4.6. Details of Terms of Reference

3.4.6.1. Specific

Environmental Management and Biodiversity Conservation	
1.	Explore the possibilities for reducing the Forest land requirement. The application for obtaining Stage I FC for 230.25 ha of forest land involved in the project shall be submitted.
2.	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.
3.	PP shall submit the detail plan for filling the reservoir in 2 years for generating envisaged capacity with excess monsoon water only.
4.	No Objection Certificate from State of Jharkhand and Bihar as there may be genuine concern of downstream consumers to avoid scarcity of water to consumers. The availability of water in the river shall be submitted by Project Proponent from Central Water Commission and State Water Resources Department.
5.	No transportation of raw materials shall be done through/within the Wildlife Sanctuary prior to the grant of State Government/ Forest Department/Wildlife Department. Accordingly, transportation plan shall be submitted by PP.

6.	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.
7.	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.
8.	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.
9.	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.
10.	Conducting site specific ecological study with respect to riverine ecology focus on fishes diversity, fish migration, habitat and aquatic biota due to construction PSP. Impact assessment on the fish diversity based on the hydrological alteration at the water drawing sources Sone River shall be studied.
11.	Cumulative Impact of project on carrying capacity and sustainability of Reservoir/ Sone River /nala of catchment area / due to tapping of water for filling reservoir.
12.	Action plan for survival or diversion of the rivulets/stream leading to join Sone river shall be submitted.
13.	Impact zone decided prior to base line data generation and accordingly, sampling location shall be finalized. Baseline data as mentioned in Standard ToR shall be collected for preparation of EIA/ EMP report along with soil characteristics which shall be studied at minimum 10 locations. The ground water level at 10 locations shall be measured in project area in all three seasons.
14.	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.
15.	Reservoir/ River banks protection plan all along the submergence need to be prepared and incorporated in EIA/ EMP.
16.	Scope of watershed development in the 10 km radius of the project shall be studied in consultation with Govt. institutions/ Indian Council of Agriculture Research (ICAR)and accordingly a detailed Water Shed Development Plan shall be prepared and incorporated in EIA/ EMP report.
17.	The project area should not come up on any critical mineral zone to be verified by GSI/NMDC.
18.	Any archaeological sites in the vicinity of the project, if any, then it shall be certified by ASI. No mineral zone on the proposed site be certified by Geological Survey of India or any other concerned Government Organization.
Socio-economic Study	
1.	All the tasks including conducting public hearing shall be done as per the provisions of EIA Notification, 2006 and as amended from time to time. Public hearing issues raised and compliance of the same shall be incorporated in the EIA/ EMP report in the relevant chapter.

2.	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.
3.	Land acquired for the project shall be suitably compensated in accordance with the law of the land with the prevailing guidelines. Private land shall be acquired as per provisions of Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013.
4.	Budget earmarked for R&R, CSR shall not include in the cost of EMP and compliance of issues raised during Public Hearing.
Muck Management/ Disaster Management	
1.	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.
2.	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.
3.	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.	PP shall submit the proposal of EAC and seek approval of CEA/CWC for DPR, with a distance of 100 mts from HFL to avoid future damage due to flood. The data and distance of HFL shall be certified by concerned State Government and shall be submitting grant submitting the proposal of grant of EC.
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 submit.
5.	Undertaking need to submitted on affidavit that regarding no activities has been yet started on the project site and water allocated to this scheme shall not be diverted to other purpose.
6.	Detailed plan to restore wider roads and convert them into narrow upto 10m after construction of the project. 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.
7.	As per Ministry's OM dated 1st August, 2013, PP shall submit application to obtain prior approval of Central Government under the Forest Conservation Act, 1980 for diversion of forest land required for such projects will be submitted as soon as the actual extent of forest land required for the project is known to the project proponent, and in case, within 6 months of issuance of ToR. However, no proposal will be put up before EAC without submission of application for forest clearance, wherever applicable.
8.	Detailed report on cumulative effect of multiple projects already proposed within the region on the same river.

3.4.6.2. Standard

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

11.	Remote Sensing studies, interpretation of satellite imagery, topographic sheets along with ground verification shall be used to develop the land use/land cover pattern of the study using overlaying mapping techniques viz. Geographic Information System (GIS), False Color Composite (FCC) generated from satellite data of project area.
12.	Land details including forests, private and other land.
13.	Demarcation of snow fed and rain fed areas for a realistic estimate of the water availability.
14.	Different riverine habitats like rapids, pools, side pools and variations in the river substratum bedrocks, rocks, boulders, sand/silt or clay etc. need to be covered under the study
Description of Environment and Baseline Data	
1.	To know the present status of environment in the area, baseline data with respect to environmental components air, water, noise, soil, land and biology & biodiversity (flora & fauna), wildlife, socioeconomic status etc. should be collected within 10 km radius of the main components of the project/site i.e. dam site and power house site. The air quality and noise are to be monitored at such locations which are environmentally & ecologically more sensitive in the study area. The baseline studies should be collected for 1 season (Preferably Monsoon season). Flora-Fauna in the catchment and command area should be documented. The study area should comprise of the following:
2.	(i) Catchment area up to the dam/barrage site.
3.	(ii) Submergence Area.
4.	(iii) Project area or the direct impact area should comprise of area within 10 km radius of the main project components like dam, canals etc.
5.	(iv) Downstream upto 10 km from the tip of the reservoir.
Details of the Methology	
1.	The methodology followed for collection of base line data along with details of number of samples and their locations in the map should be included. Study area should be demarcated properly on the appropriate scale map. Sampling sites should be depicted on map for each parameter with proper legends. For Forest Classification, Champion and Seth (1968) methodology should be followed.
Methodology for Collection of Biodiversity Data	
1.	The number of sampling locations should be adequate to get a reasonable idea of the diversity and other attributes of flora and fauna. The guiding principles should be the size of the study area (larger area should have larger number of sampling locations) and inherent diversity at the location, as known from secondary sources (e.g. eastern Himalayan and low altitude sites should have a larger number of sampling locations owing to higher diversity).
2.	The entire area should be divided in grids of 5kmX5km preferably on a GIS domain. There after 25% of the grids should be randomly selected for sampling of which half should be in the directly affected area (grids including project components such as reservoir, dam, powerhouse, tunnel, canal etc.) and the remaining in the rest of the area (areas of influence in 10 km radius form project components). At such chosen location, the size and number of sampling units (e.g. quadrates in case of flora/transects in case of fauna) must be decided by species area curves and the details of the same (graphs and cumulative number of species in a tabulated form) should be provided in the EIA report. Some of the grids on the edges may not be completely overlapping with the study area boundaries. However, these should be counted and considered for selecting 25% of the grids. The number of grids to be surveyed may come out as a decimal number (i.e. it has an integral and a fractional part) which should be rounded to the next whole number.

3.	The conventional sampling is likely to miss the presence of rare, endangered and threatened (r.e.t.) species since they often occur in low densities and in case of faunal species are usually secretive in behaviour. Reaching the conclusion about the absence of such species in the study area based on such methodology is misleading. It is very important to document the status of such species owing to their high conservation value. Hence likely presence of such species should be ascertained from secondary sources by a proper literature survey for the said area including referring to field guides which are now available for many taxonomic groups in India. Even literature from studies/surveys in the larger landscapes which include the study area for the concerned project must be referred to, since most species from adjoining catchments is likely to be present in the catchments in question. In fact such literature form the entire state can be referred to. Once a listing of possible r.e.t. species form the said area is developed, species specific methodologies should be adopted to ascertain their presence in the study area which would be far more conclusive as compared to the conventional sampling. If the need be, modern methods like camera trapping can be resorted to, particularly for areas in the eastern Himalayas and for secretive/nocturnal species. A detailed listing of the literature referred to, for developing lists of r.e.t. species should be provided in the EIA reports.The conventional sampling is likely to miss the presence of rare, endangered and threatened (r.e.t.) species since they often occur in low densities and in case of faunal species are usually secretive in behaviour. Reaching the conclusion about the absence of such species in the study area based on such methodology is misleading. It is very important to document the status of such species owing to their high conservation value. Hence likely presence of such species should be ascertained from secondary sources by a proper literature survey for the said area including referring to field guides which are now available for many taxonomic groups in India. Even literature from studies/surveys in the larger landscapes which include the study area for the concerned project must be referred to, since most species from adjoining catchments is likely to be present in the catchments in question. In fact such literature form the entire state can be referred to. Once a listing of possible r.e.t. species form the said area is developed, species specific methodologies should be adopted to ascertain their presence in the study area which would be far more conclusive as compared to the conventional sampling. If the need be, modern methods like camera trapping can be resorted to, particularly for areas in the eastern Himalayas and for secretive/nocturnal species. A detailed listing of the literature referred to, for developing lists of r.e.t. species should be provided in the EIA reports.
4.	The R.E.T. species referred to in this point should include species listed in Schedule I and II of Wildlife (Protection) Act, 1972 and those listed in the red data books (BSI, ZSI and IUCN).
Components of the EIA Study: Various aspects to be studied and provided in the EIA/EMP report are as 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.
1	Changes in land use / land cover and drainage pattern

3.	
14.	Immigration of labour population
15.	Quarrying operation and muck disposal
16.	Changes in land quality including effects of waste disposal
17.	River bank and their stability
18.	Impact due to submergence.
19.	Impact on forests, flora, fauna including wildlife, migratory avi-fauna, rare and endangered species, medicinal plants etc.
20.	Pressure on existing natural resources
21.	Deforestation and disturbance to wildlife, habitat fragmentation and wild animal's migratory corridors
22.	Compensatory afforestation-identification of suitable native tree species for compensatory afforestation and green belt.
23.	Impact on fish migration and habitat degradation due to decreased flow of water
24.	Impact on breeding and nesting grounds of animals and fish.
25.	Impact on local community including demographic profile.
26.	Impact on socio-economic status
27.	Impact on economic status.
28.	Impact on human health due to water / vector borne disease
29.	Impact on increase traffic
30.	Impact on Holy Places and Tourism
31.	Impacts of blasting activity during project construction which generally destabilize the land mass and leads to landslides, damage to properties and drying up of natural springs and cause noise population will be studies. Proper record shall be maintained of the baseline information in the post project period.

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

11.	Muck Disposal Plan- suitable sites for dumping of excavated material should be identified in consultation with the State Pollution Control Board and Forest Department. All Muck disposal sites should be minimum 30 m away from the HFL of river. Plan for rehabilitation of muck disposal sites should also be given. The L- section/ cross section of muck disposal sites and approach roads to be given. Financial out lay for this may be given separately. Deatailed muck transportation plan delinating the path ways, number of trucks, quantity of muck to be transportated along with monitoring mechanism using latest technology, shall be prepared.
12.	Restoration Plan for Quarry Sites and landscaping of colony areas, working areas, roads etc. Details of the coarse/fine aggregate/clay etc. required for construction of the project and the rock/clay quarries/river shoal sites identified for the project should be discussed along-with the Engineering and Biological measures proposed for their restoration with physical and financial details. Layout map showing quarry sites vis-à-vis other project components, should be prepared.
13.	Resettlement and Rehabilitation Plan needed to be prepared on the basis of findings of the socio- economic survey coupled with the outcome of public consultation held. The R&R package shall be prepared after consultation with the representatives of the project affected families and the State Government. Detailed budgetary estimates are to be provided. Resettlements site should be identified. The plan will also incorporate community development strategies.
14.	Public Health Delivery Plan including the provisions of drinking water supply for local population shall be in the EIA/EMP Report. Status of the existing medical facilities in the project area shall be discussed. Possibilities of strengthening of existing medical facilities, construction of new medical infrastructure etc. will be explored after assessing the need of the labour force and local populace.
15.	Local Area Development Plan to be formulated in consultation with the Revenue Officials and Village Pancahayats. Appropriate schemes shall be prepared under EMP for the Local Area Development Plan with sufficient financial provisions.
16.	Labour Management Plan for their Health and Safety.
17.	Sanitation and Solid waste management plan for domestic waste from colonies and labour camps etc.
18.	Energy Conservation Measures for the work force during construction with physical and financial details. Alternatives will be proposed for the labour force so that the exploitation of the natural resource (wood) for the domestic and commercial use is curbed.
19.	Environmental safeguards during construction activities including Road Construction.
20.	A summary of Cost Estimates for all the plans, cost for implementing all the Environmental Management Plans.
21.	Water, Air and Noise Management Plans to be implemented during construction and post-construction periods.

Day 2 -19/07/2024

3.1. Agenda Item No 1:

3.1.1. Details of the proposal

Kutehr Hydro-electric Project (240 MW) by **JSW ENERGY (KUTEHR) LIMITED** located at **CHAMBA,HIMA CHAL PRADESH**	
Proposal For	Application for Validity Extension of EC- Form-6

Proposal No	File No	Submission Date	Activity (Schedule Item)
IA/HP/RIV/480995/2024	J-12011/67/2007-IA-I	14/06/2024	River Valley/Irrigation projects (1(c))

3.1.2. Project Salient Features

12.5.1 The proposal is for grant of Extension Validity of Environmental Clearance (EC) to the project for Kutehr Hydro-electric Project (240 MW) in an area of 69.3783 ha. located at Village Machhettar, Sub District Bharmour, Holi, Chamba District Chamba, Himachal Pradesh by M/s Jsw Energy (Kutehr) Limited.

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

i. The Kutehr Hydroectric Project (240 MW) is being developed on Ravi river in Chamba district of Himachal Pradesh. The project is envisaged as run-of- the-river scheme in the upper reaches of Ravi basin.

ii. The Environment Clearance was granted to Kutehr 240 MW Hydroelectric Project on 05th Jul, 2011. It was subsequently, amended on 18th Jun 2021 (Extension in validity of EC) & 16th Nov. 2021 (Transfer of EC from Mis JSW Energy Limited to Mis JSW Energy (Kutehr) Limited). The EC is valid upto 4th July 2024.

iii. Implementation Agreement was signed with GoHP in the year 2011. Concession period is 40 years from COD. Zero Date for start of Construction works of project has been redefined as 29.10.2019 by GoHP vide Second Supplementary IA dated 27.01.2021. Anticipated investment in the project to the tune of Rs. 2879 Crores. As of April 2024, about 80% of the project work has been completed. According to our commitment with the State Government of Himachal Pradesh, the remaining work is projected to be completed by October 2024.

iv. The overall progress of the project was mainly delayed due to the following main reasons:

a) **Natural Calamities (Rain & Snow fall):** Regular landslides and blockade on NH 154 A and project road are experienced since beginning of the project due to heavy rainfall and snowfall. Due to this the project timelines are significantly affected as the vehicle movement and supply chain management is totally hampered.

b) **High flood**: Every monsoon season barrage works was delayed for at least 3 months/year due to flash floods and heavy rainfall. In the year 2022 barrage works was stooped due to flash floods (3 times) and in the year 2023 the ongoing works of the barrage was stopped for 3 months i.e., July August & September due to the high flood occurred on 8th of July 2023.

c) **COVID-19 Pandemic:** Due to lockdown imposed by Government of India and Government of Himachal Pradesh because of COVID -19 pandemic, all works were stopped from 23.03.2020. Some activities with the available resources at site was started w.e.f. 15.06.2020/

d) **Cloud bursts**: 2 No's Cloud bursts at Sanah Nala in the month of July -2023 at Adit-3 which washed away the construction equipment of contractor and damaged the approach road to the adit-3. Due to this, the HRT works were delayed by almost 2 months at Adit-3

e) **Bridges:** The whole supply chain and vehicle movement was disturbed due to the damages of the bridges. In the year 2022- 23, a bridge near Kharamukh was damaged and in the year 2023-24 two bridges i.e., one at Choli and other at Luna was collapsed which delays the project works by almost 1 months.

Landslide at Kharamukh – Holi Road: Due to heavy rains from 14.04.2024 to 16.04.2024 huge landslide occurred at Kharamukh to Holi Road (1.8 km from Kharamukh) and approach road to Adit-6 & Bottom of Surge Shaft un the early hours of 17.04.2024. Due to this landslide about 150 meters of Kharamukh Holi road and about 200 meters of approach road to Adit-6 has been damaged badly. The restoration of damaged roads is still going on

3.1.3. Deliberations by the committee in previous meetings

N/A

3.1.4. Deliberations by the EAC in current meetings

12.5.3 The EAC during deliberations noted the following:
The EAC deliberated on the information submitted and as presented in the meeting and observed that the proposal is for grant of Extension of Validity of Environmental Clearance (EC) dated 05.07.2011 to the project for Kutehr Hydro-electric Project (240 MW) in an area of 69.3783 ha. located at Village Machhettar, Sub District Bharmour, Holi, Chamba District Chamba, Himachal Pradesh by M/s Jsw Energy (Kutehr) 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 committee noted that EC to the said project was granted on 05.07.2011 and subsequently, EC was further extended vide letter dated 16.11.2021. Additionally, the EAC noted that Stage -II FC was granted by MoEF&CC on 11.01.2013, therefore as per OM no. IA3-22/10/2022-IA.III[E-177258] dated 11.04.2022 validity of EC shall be counted from 11.01.2013. The EAC noted that EC is valid till 10.01.2027 as per provisions of the EIA Notification, 2006, as amended.
Therefore, the proposal was ***returned in present*** form.

3.1.5. Recommendation of EAC

Returned in present form

3.2. Agenda Item No 2:

3.2.1. Details of the proposal

Subansiri Upper HE Project by **NHPC LIMITED** located at **UPPER SUBANSIRI,ARUNACHAL PRADESH**			
Proposal For		Fresh ToR	
Proposal No	**File No**	**Submission Date**	**Activity (Schedule Item)**
IA/AR/RIV/466971/2024	J-12011/59/2010-IA-I (R)	24/06/2024	River Valley/Irrigation projects (1(c))

3.2.2. Project Salient Features

12.6.1: The proposal is for grant of Terms of References (ToR) to Subansiri Upper HE Project (1605 MW) in an area of 2972 ha. located at Village Pairijo, Tehsil Gussar, District Upper Subansiri, Arunachal Pradesh by M/s NHPC Limited.
12.6.2: The Project Proponent made a detailed presentation on the salient features of the project and informed that:

i. The proposal is for ToR to the project for Subansiri Upper HE Project located at about 1.5 km u/s of Menga village and about 25 km from Daporijo in Upper Subansiri District, Arunachal Pradesh by M/s NHPC Ltd.

ii. The geographical co-ordinate of the project are Lat. 28°06'34.05"N, Long. 94°09'20.45"E.

iii. **The Project envisages construction of:** The Subansiri Upper HE Project envisages construction of 1605 MW hydroelectric project with the twin objectives of power generation and flood moderation**.**

iv. **Demographic details in 10 km radius of project area:** About 27 nos. of villages comprising 982 families are likely to be affected due to the proposed Project. The socio-economic study aims to assess the overall impacts on various facets of socio- economic environment due to establishment of the project. The information on various aspects of the affected population viz., demographic details, socio-economic and cultural characteristics, enumeration of personal properties of the affected population, education level and occupational profile etc. shall be collected besides ethnographic assessment of PAFs during the EIA & SIA study.

v. **Project Cost**: The estimated project cost is Rs. 21815.00 Crore. Total capital cost earmarked towards environmental pollution control measures is approx. **2% to 3%** of the estimated project cost. Detail allocation along with Recurring cost (operation and maintenance) shall be done after preparation of EIA/EMP study.

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

vii. **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.

viii. **MoU/ any other clearance/ permission signed with State government:** Memorandum of Agreement signed on 12.08.2023 between Govt. of Ar. P and NHPC Ltd for development, commissioning, implementation, operation and maintenance of Subansiri Upper HEP on BOOT basis for a lease period of 40 years from the commercial operation date.

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

x. **Environmental Flow:** For sustainable hydropower development of Subansiri river basin, IA-1 Division of MoEF&CC vide their letter No. 2/18 (A)/ 2014-EIA dated 27.04.2016 has approved study report on Cumulative Impact Assessment & Carrying Capacity Study (CIA&CCS) of Subansiri river basin in Arunachal Pradesh for development of Hydroelectric Power Projects. The study outlines the recommended capacity, size and location of HEP's commensurate with basin environment carrying capacity conforming to the accepted cumulative impacts. As per recommendations, following environment flows are approved:

Seasons	Environment Flows (% age)
Monsoon Season (June- September)	20
Non-Monsoon Non-lean (March-May and October)	20
Lean Season (November-February)	20

xi. **Alternative Studies:** Developing and assessing various alternative schemes is one of the first activities during the preparation of the DPR. Various alternative studies have been carried out for arriving at the most optimal location & layout of the Project. While carrying out the

detailed studies, different axes have been identified by various agencies, as under:

River Subansiri originates from Tibet and after traversing 375 km joins the Brahmputra river. It is one of the largest right bank tributaries of Brahmaputra. The total catchment area of Subansiri River up to the proposed dam site at Menga is 14665 Sq. Km. Brahmaputra Board had prepared Detailed Project Report (DPR) after conducting detailed survey and investigation of 257 m high Subansiri Dam Project (4800 MW) in April 1983 at Gerukamukh where the river debouches into the Assam plain. The proposal could not get through due to reservations from Government of Arunachal Pradesh on account of large submergence of land and townships like Daporijo, Dumporijo, Tamen etc. and consequent displacement of inhabitants.

Subsequent to shelving of high dam near Gerukamukh on Subansiri river by Brahmaputra Board it was proposed to build high dams in the upper reaches. Accordingly, on Subansiri river four alternate sites were examined near Daporijo (Headquarter of Upper Subansiri district) along river Subansiri, (refer Plate 4) viz.

1. Site A, 3.5 km upstream of Daporijo.
2. Site B, 31 km upstream of Daporijo.
3. Site C, a little upstream of Menga confluence.
4. Site D, a little upstream of Sippi Village.

Out of these four possible sites, Brahamputra Board in consultation with CWC and GSI, considered site-C located at about 1.5 km up stream of confluence between river Menga and river Subansiri as better option. This site was preferred over other sites by the team due to occurrence of massive and strong dolomitic rocks striking almost across the river and having subvertical firm dam abutment in a narrow valley and it was decided to investigate the same.

Subsequent to taking over the Project by NHPC detailed field traverses were also undertaken to locate any other alternative suitable sites in upstream as well as downstream along the river course. But as evaluated by the technical team during Brahmaputra Board period investigation, the site upstream of Menga village is found to be relatively better site to host Project components because of strong to very strong dolomitic limestone. Accordingly, this was considered for detailed investigation. For better abutment condition the dam axis was reviewed and relocated at 75m d/s from Brahmaputra Board site “C”.

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

Sewage and solid waste shall be generated from project colonies during construction as well as operational phase.

Solid waste generated from temporary and permanent colonies during construction as well as operation phase shall be disposed off as per the Solid Wastes Management Rules (SWM), 2016.

Shall be handled as per Hazardous Waste Management Rules, 2016.

Muck disposal plan shall be finalized after EIA/EMP study.

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

- **Project details:**
- **Category details:**

Name of the Pro	TOR Approval

posal	or Subansiri Upper HE Project
Location (Including coordinates)	About 1.5 km u/s of Menga village and about 25 km from Daporijo in Distt. Upper Subansiri, Arunachal Pradesh. Lat. 28°06'34.05" N, Long. 94°09'20.45"E
Inter-state issue involve	No

d	
Seismic zone	Zone-V

Category of the project	1(c) River Valley/Irrigation projects Sector : RIV
Provisions	A Hydro Electric Project with the twin objectives of power generation and flood moderation.
Capacity / Cultural command area (CCA)	1605 MW
Attracts the General Conditions (Yes/No)	No
Additional information (if any)	Nil

- **Electricity generation capacity:**

Powerhouse Installed Capacity	1605 MW
Generation of Electricity Annually	6131.55 MU
No. of Units	8 Units (Main Unit- 7 x 215 & Auxiliary Unit 1 x 100) = 1605 MW
Additional information (if any)	Nil

- **ToR/EC Details:**

Cost of project	Rs. 21,815 Crore
Total area of Project	2972 Ha
Height of Dam from River Bed (EL)±253	219m
Length of Tunnel/Channel	12.5 Km including all water conveying tunnels and construction/Access Tunnel
Details of Submergence area	2220 Ha
Types of Waste and quantity of generation during construction/ Operation	Hydroelectric projects do not generate any bye-product during electricity generation. Hydroelectric power is generated by non-consumptive use of water. However, during construction phase of the project, about 11,500 KLD per day of waste water; 60 lakh cum of muck & Solid Waste shall be generated. A detailed management plan shall be prepared during EIA study in line of Standard TOR.

E-Flows for the Project	Environment flow has been considered based on Cumulative Impact and Carrying Capacity Studies (CI &CC) of Subansiri Basin including downstream impacts wherein minimum environmental flow has been considered as 20% of the average flow in monsoon, Pre & Post monsoon and lean period of 90% dependable year.
Is Projects earlier studies in Cumulative Impact assessment & Carrying Capacity studies (CIA&CC) for River in which project located. If yes, then a) E-flow with TOR /Recommendation by EAC as per CIA&CC study of River Basin. b) If not the E-Flows maintain criteria for sustaining river ecosystem.	Yes. As mentioned above

- **Muck Management Details:**

No. of proposed disposal area/(type of land-Forest/Pvt. land)	35 ha area is proposed for muck disposal and the land status is USF/community land.
Muck Management Plan	Shall be prepared in EMP based on EIA studies.
Monitoring mechanism for Muck Disposal	Shall be prepared in EMP based on EIA studies

- **Land Area Breakup:**

Private land / Non Forest Land	Nil
Government land or Forest Land/USF	2972 Ha
Submergence area/Reservoir area	2220 ha at FRL 460 M
Land required for project components	200 Ha
Additional information (if any)	

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

Forest Land/ Protected Area/Environmental Sensitivity Zone	**Yes/No**	**Details of Certificate/Letter/Remarks**
Reserve Forest/Protected Forest Land	No	No Protected area falls within the 10 Km radius of project component including the reservoir
National Park	No	
Wildlife Sanctuary	No	

- **Court case details: NIL**
- **Previous EC compliance and necessary approvals:**

Particulars	Nil

Certified EC compliance report (if applicable)	NA
Status of Stage-I FC	An application for Forest Clearance for diversion of 2972 ha shall be filed on PARIVESH 2.0 during DPR Preparation.
Is FRA (2006) done for FC-I	Shall be carried out during process of Forest Clearance

Particulars	**Details**
Details of consultant	Tender were floated for hiring of Consultant for EIA/EMP study based on Standard TOR after accord of ToR. Further, any additional recommendation of EAC shall be taken care of by the Consultant.
Project Benefits	Free Power @12% to home state; LADF @1%; Power injection to National Grid; Benefit Under R&R plan; Reduced dependence on Fossil Fuels; Clean Energy Generation; Economic Development; regulated Water Flow, manage Floods, benefiting both the local communities and the environment; Energy Independence; Rural Electrification; Sustainable Development, promoting economic growth, and enhancing energy security for both the state and the nation as a whole.
Status of other statutory clearance	In the process of applying to concerned Directorate / Department of GOI/ GoAP
R&R details (Tentative)	No. of Villages: 27 Nos. of PAFs: 982 R&R Plan: Shall be firmed up during SIA study.

3.2.3. Deliberations by the committee in previous meetings

N/A

3.2.4. Deliberations by the EAC in current meetings

12.6.3 The EAC during deliberations noted the following:

- The EAC deliberated on the information submitted (Form 1, PFR, kml file, etc.) and as presented in the meeting and observed that the proposal is for grant of terms of references (ToR) to the project for Subansiri Upper HE Project (1605 MW) in an area of 2972 ha. located at Village Pairijo, Tehsil Gussar, District Upper Subansiri, Arunachal Pradesh by M/s NHPC Limited.
- The project/activity is covered under Category A of item 1 (c) 'River Valley & Hydroelectric projects' of the Schedule to the Environmental Impact Assessment Notification, 2006 and requires appraisal at Central level by the sectoral EAC in the Ministry.

- The EAC observed that Subansiri Upper HE Project is proposed to be developed on Subansiri River in Arunachal Pradesh as a multipurpose project with twin objectives of power generation and flood moderation. Subansiri Upper HE Project was initially allotted to NHPC vide order dated 01.05.2000 and NHPC had submitted Feasibility Report of the project in June 2002. Approval to the Feasibility Report was accorded by CEA on 10.09.2002 and subsequently, NHPC carried out detailed study & field investigations for preparation of DPR. Later on GoArP decided to get the project implemented through Private Developers. The Project was allotted to M/s KSK Energy Ventures Ltd. by GoArP on BOOT basis for a lease period of 40 years from the Commercial Operation as per MOA dated 18.03.2010. M/s KSK submitted few DPR chapters but no Technical clearance was received. However, due to various reasons further progress for project development and submission of DPR not made by M/s KSK. Ministry of Power (MOP) vide letter dated 22.12.2021 allotted the Project to NHPC for its development. NOC for Subansiri Upper HEP was issued by Govt. of Arunachal Pradesh on 28.06.2023 and approved allotment of projects to NHPC on 21.07.2023. MOA was signed on 12.08.2023 between GOAP and NHPC Limited for development, commissioning, implementation, operation and maintenance of Subansiri Upper HEP on BOOT basis for a lease period of 40 years from the COD.

The EAC inquired about the proposed fish pass in the project, to which PP replied that there will be no fish pass proposed in the said HEP, therefore the committee opined that PP need to justify the reason for not proposing fish pass/fish ladder in the current proposal.

3.2.5. Recommendation of EAC

Recommended

3.2.6. Details of Terms of Reference

3.2.6.1. Specific

Environmental Management and Biodiversity Conservation	
1.	The project involves diversion of 2972 Ha of forestland. Forest clearance shall be obtained as per the prevailing norms of Forest (Conservation) Act, 1980. Application to obtain prior approval of Central Government under the Forest (Conservation) Act, 1980, for diversion of forestland required, should be submitted as soon as the actual extent of forestland required for the project is known, and in any case, within six months of issuance of this letter.
2.	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.
3.	The longitudinal connectivity/Free flowing sketch be provided in the EIA/EMP report.
4.	Environmental matrix during construction and operational phase needs to be submitted. Matrix formulated on the basis of detailed study and field survey of flora and Fauna methodology used shall be mentioned in the EIA report.
5.	Details of Flora and Fauna reported in submergence area, Nos. of tree along with their density and nomenclature required to be cut for barrage creation and other project component.
6.	Three season (Pre-monsoon, Monsoon and winter season) baseline data of all the environmental attributes including biological environment as mentioned in the Standard ToR shall be collected for preparation of EIA/EMP report.

7.	Source of construction material and its distance from the project site along with detailed transportation plan for construction material.
8.	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.
9.	A detailed wildlife conservation plan for Schedule –I species be prepared duly approved by the Chief Wild Life Warden be submitted.
10.	Explore the possibilities to reduce forest area for the construction of proposed project. Reduction of forest land with changing installed capacity.
11.	Conduct geological survey and find out availability of mineral in study area. Take Geological opinion from GSI regarding mineral zone in the project study area.
12.	Density of forest and its types including tentative nos of tree felled during construction of the project and details of plants species to be planted under compensatory plantation be mentioned in Compensatory Afforestation Plan under EIA/EMP.
13.	Identify the sand mining/ quarrying sites in submergence area and downstream of reservoir. Source of construction material and its distance from the project site along with detailed transportation plan for construction material.
14.	A detailed reclamation/ restoration plan of quarrying site/sites be incorporated in the EIA/EMP report.
15.	Certificate and certified map from Chief Wildlife Warden shall be submitted mentioning that project boundary is located outside the Eco Sensitive Zone (ESZ) and Wildlife Sanctuary.
16.	In case any Wildlife corridor is located within 10 km radius of the project site a detailed study shall be conducted to assess the impact of project on safe movement of wild animals.
17.	Reservoir/ River banks protection plan all along the submergence need to be prepared and incorporated in EIA/ EMP.
18.	Endemic plant and animal species found in the area concerned shall be provided instead listing entire endemic species found in the State.
19.	Details of Flora and Fauna reported in submergence area, Nos. of tree along with their density and nomenclature of the tree species required to be felled for reservoir creation and other project component.
20.	Project impact on avi-fauna shall be studied and incorporated in EIA/ EMP report.
21.	The project proponent must also include information if any, on the critical mineral zone mining or potential in the projected area from Geological Survey of India /Mineral Exploration Corporation Ltd or similar such Government organizations.
Socio-economic Study	
1.	All the tasks including conducting public hearing shall be done as per the provisions of EIA

	Notification, 2006 and as amended from time to time. Public hearing issues raised and compliance of the same shall be incorporated in the EIA/ EMP report in the relevant chapter.
2.	Statement on the commitments (activity-wise) made during public hearing to facilitate the discussion on the CER in compliance of the Ministry's OM F.No.22- 65/2017- IA.III dated 30th September, 2020 shall be submitted.
3.	Tentative no. of project affected families shall be identified and accordingly appropriate Rehabilitation & Resettlement plan shall be prepared. Details of settlement in 10 km area shall be submitted.
4.	Land acquired for the project shall be suitably compensated in accordance with the law of the land with the prevailing guidelines. Private land shall be acquired as per provisions of Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013.
Muck Management/ Disaster Management	
1.	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.
2.	Details of water sprinkling arrangements for arresting the fugitive / dust, emission from transportation and other project activities in project construction area.
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.	CAT plan, Dam break analysis, Disaster Management Plan and Fisheries Management Plan be prepared along with other EMPs and incorporated in the EIA/EMP report.
2.	Pre-DPR Chapters viz., Hydrology, Layout Map and Power Potential Studies duly approved by CWC /CEA shall be submitted.
Miscellaneous	
1.	Pre-DPR Chapters viz. Layout Map and Power Potential Studies duly approved by CWC/CEA shall be submitted.
2.	Undertaking need to submitted on affidavit that regarding no activities has been yet started on the project site and water allocated to this scheme shall not be diverted to other purpose.
3.	Both capital and recurring expenditure under EMP shall be submitted.
4.	The photograph should bear the date, time, latitude & longitude of the monitoring station/ sampling location. In addition to this PP should submit the original test reports and certificates of the labs which will analyse the samples.

5.	Aerial view video of project site shall be recorded and to be submitted.
6.	Detailed plan to restore wider roads and convert them into narrow upto 10m after construction of the project.

3.2.6.2. Standard

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

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

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

13.	null
14.	Soil classification, physical parameters (viz., texture, Porosity, Bulk Density and water holding capacity) and chemical parameters (viz. pH, electrical conductivity, magnesium, calcium, total alkalinity, chlorides, sodium, potassium, organic carbon, available potassium, available phosphorus, SAR, nitrogen and salinity, etc.) at @ one sample/ha of command area.
15.	null
16.	(i) Generation of thematic maps viz, slope map, drainage map, soil map, land use and land cover map, etc. Based on these, thematic maps, an erosion intensity map should be prepared.
17.	null
18.	History of the ground water table fluctuation in the study area.
19.	Water quality for both surface water and ground water for (i) Physical parameters (pH, temperature, electrical conductivity, TSS); (ii) Chemical parameters (Alkalinity, Hardness, BOD, COD, NO2, PO4, CI, SO4, Na, K, Ca, Mg, Silica, Oil & Grease, phenolic compounds, residual sodium carbonate); (iii) Bacteriological parameter (MPN, Total coliform) and (iv) Heavy Metals (Pb, As, Hg, Cd, Cr-6, total Cr, Cu, Zn, Fe) (6 locations).
20.	Delineation of sub and micro-watersheds, their locations and extent based on the All India Soil and Land Use Survey of India (AISLUS), Department of Agriculture, Government of India. Erosion levels in each micro-watershed and prioritization of micro-watershed through silt yield index (SYI) method of AISLUS
21.	Hydro-Meteorology of the project viz. precipitation (snowfall, rainfall), temperature, relative humidity, etc. Hydro-meteorological studies in the catchment area should be established along-with real time telemetry and data acquisition system for inflows monitoring.
22.	Run off, discharge, water availability for the project, sedimentation rate, etc.
23.	Basin characteristics
24.	Catastrophic events like cloud bursts and flash floods, if any, should be documented.
25.	For estimation of Sedimentation Rate, direct sampling of river flow is to be done during the EIA study. The study should be conducted for minimum one year. Actual silt flow rate to be expressed in ha-m km2 year-1.
26.	Set up a G&D monitoring station and a few rain gauge stations in the catchment area for collecting data during the investigation.
27.	Flow series, 10 daily with 90%, 75% and 50% dependable years discharges.
28.	Information on the 10-daily flow basis for the 90 per cent dependable year the flow intercepted at the dam, the flow diverted to the power house and the spill comprising the environmental flow and additional flow towards downstream of the dam for the project may be given.
29.	The minimum environmental flow shall be 20% of the flow of four consecutive lean months of 90% dependable year, 30% of the average monsoon flow. The flow for remaining months shall be in between 20-30%, depending

	on the site specific requirements. A site specific study shall be carried out by an expert organization.
30.	Sedimentation data available with CWC may be used to find out the loss in storage over the years.
31.	Hydrological studies/data as approved by CWC shall be utilized in the preparation of EIA/EMP report. Actual hydrological annual yield may also be given in the report. Sedimentation data available with CWC may be used to find out the loss in storage over the years.
32.	A minimum of 1 km distance from the tip of the reservoir to the tail race tunnel should be maintained between upstream and downstream projects.
33.	Besides primary studies, review of secondary data/literature published for project area on flora & fauna including RET species shall be reported in EIA/EMP report.
34.	null
35.	Characterization of forest types (as per Champion and Seth method) in the study area and extent of each forest type as per the Forest Working Plan.
36.	Documentation of all plant species i.e. Angiosperm, Gymnosperm, Pteriodophytes, Bryophytes (all groups).
37.	General vegetation profile and floral diversity covering all groups of flora including lichens and orchids. A species wise list may be provided.
38.	Assessment of plant species with respect to dominance, density, frequency, abundance, diversity index, similarity index, importance value index (IVI) , Shannon Weiner index etc. of the species to be provided. Methodology used for calculating various diversity indices along with details of locations of quadrates, size of quadrates etc. to be reported within the study area in different ecosystems.
39.	Existence of National park, Sanctuary, Biosphere Reserve etc in the study area, if any, should be detailed.
40.	Economically important species like medicinal plants, timber, fuel wood etc.
41.	Details of endemic species found in the project area.
42.	Flora under RET categories should be documented using International Union for the Conservation of Nature and Natural Resources (IUCN) criteria and Botanical Survey of India's Red Data list along-with economic significance. Species diversity curve for RET species should be given.
43.	Cropping pattern and Horticultural Practices in the study area.
44.	null
45.	Fauna study and inventorisation should be carried out for all groups of animals in the study area. Their present status alongwith Schedule of the species.
46.	Documentation of fauna plankton (phyto and zooplankton), periphyton, benthos and fish should be done and analysed.

47.	Information (authenticated) on Avi-fauna and wildlife in the study area.
48.	Status of avifauna their resident/ migratory/ passage migrants etc.
49.	Documentation of butterflies, if any, found in the area.
50.	Details of endemic species found in the project area.
51.	RET species-voucher specimens should be collected along-with GPS readings to facilitate rehabilitation. RET faunal species to be classified as per IUCN Red Data list and as per different schedule of Indian Wildlife (Protection) Act, 1972.
52.	Existence of barriers and corridors, if any, for wild animals.
53.	Compensatory afforestation to compensate the green belt area that will be removed, if any, as part of the proposed project development and loss of biodiversity.
54.	Collection of primary data on agricultural activity, crop and their productivity and irrigation facilities components.
55.	For categorization of sub-catchment into various erosion classes and for the consequent CAT plan, the entire catchment (Indian Portion) is to be considered and not only the directly the draining catchment.
56.	Documentation of aquatic fauna like macro-invertebrates, zooplankton, phytoplantktons, benthos etc.
57.	Fish and fisheries, their migration and breeding grounds.
58.	Fish diversity composition and maximum length & weight of the measured populations to be studies for estimation of environmental flow.
59.	Conservation status of aquatic fauna.
60.	Sampling for aquatic ecology and fisheries and fisheries must be conducted during three seasons Pre-monsoon (summer), monsoon and winter. Sizes (length & weight) of important fish species need to be collected and breeding and feeding grounds should also be identified along the project site or in vicinity.
61.	Collection of baseline data on human settlements, health status of the community and existing infrastructure facilities for social welfare including sources of livelihood, job opportunities and safety and security of workers and surroundings population.
62.	Collection of information with respect to social awareness about the developmental activity in the area and social welfare measures existing and proposed by project proponent.
63.	Collection of information on sensitive habitat of historical, cultural and religious and ecological importance.
64.	The socio-economic survey/ profile within 10 km of the study area for demographic profile; Economic Structure; Developmental Profile; Agricultural Practices; Infrastructure, education facilities; health and sanitation facilities; available communication network etc.

65.	Documentation of demographic, Ethnographic, Economic Structure and development profile of the area.
66.	Information on Agricultural Practices, Cultural and aesthetic sites, Infrastructure facilities etc.
67.	Information on the dependence of the local people on minor forest produce and their cattle grazing rights in the forest land.
68.	List of all the Project Affected Families with their name, age, educational qualification, family size, sex, religion, caste, sources of income, land & house holdings, other properties, occupation, source of income, house/land to be acquired for the project and house/land left with the family, any other property, possession of cattle, type of house etc.
69.	Special attention has to be given to vulnerable groups like women, aged persons etc. and to any ethnic/indigenous groups that are getting affected by the project.
Impact Prediction and Mitigation Measures	
1.	The adverse impact due to the proposed project should be assessed and effective mitigation steps to abate these impacts should be described.
2.	Changes in ambient and ground level concentrations due to total emissions from point, line and area sources.
3.	Effect on soil, material, vegetation and human health.
4.	Impact of emissions from DG set used for power during the construction, if any, on air environment.
5.	Pollution due to fuel combustion in equipments and vehicles
6.	Fugitive emissions from various sources
7.	Changes in surface and ground water quality
8.	Steps to develop pisci-culture and recreational facilities
9.	Changes in hydraulic regime and downstream flow.
10.	Water pollution due to disposal of sewage
11.	Water pollution from labour colonies/ camps and washing equipment.
12.	Adverse impact on land stability, catchment of soil erosion, reservoir sedimentation and spring flow (if any) (a) due to considerable road construction / widening activity (b) interference of reservoir with the inflowing stream (c) blasting for commissioning of HRT, TRT and some other structures.
13.	Changes in land use / land cover and drainage pattern
14.	Immigration of labour population
15.	Quarrying operation and muck disposal

16.	Changes in land quality including effects of waste disposal
17.	River bank and their stability
18.	Impact due to submergence.
19.	Impact on forests, flora, fauna including wildlife, migratory avi-fauna, rare and endangered species, medicinal plants etc.
20.	Pressure on existing natural resources
21.	Deforestation and disturbance to wildlife, habitat fragmentation and wild animal's migratory corridors
22.	Compensatory afforestation-identification of suitable native tree species for compensatory afforestation and green belt.
23.	Impact on fish migration and habitat degradation due to decreased flow of water
24.	Impact on breeding and nesting grounds of animals and fish.
25.	Impact on local community including demographic profile.
26.	Impact on socio-economic status
27.	Impact on economic status.
28.	Impact on human health due to water / vector borne disease
29.	Impact on increase traffic
30.	Impact on Holy Places and Tourism
31.	Impacts of blasting activity during project construction which generally destabilize the land mass and leads to landslides, damage to properties and drying up of natural springs and cause noise population will be studies. Proper record shall be maintained of the baseline information in the post project period.
32.	Positive and negative impacts likely to be accrued due to the project are listed.
Environmental Management Plan	
1.	null

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

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

4. Any Other Item(s)

N/A

5. List of Attendees

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

4	Dr J V Tyagi	Member (EAC)	jvt******@gmail.com	
5	Dr J A Johnson	Member (EAC)	jaj@wii.gov.in	Absent
6	Shri Kartik Sapre	Member (EAC)	kar********@gmail.com	
7	Shri Ajay Kumar Lal	Member (EAC)	akl****@gmail.com	
8	Shri Alok Paul Kalsi	Member (EAC)	emo***@nic.in	Absent
9	Dr A K Sahoo	Member (EAC)	ami***@gmail.com	Absent
10	Shri Rajeev Varshney	Representative of Central Electricity Authority (CEA),	rva**********@gov.in	
11	Mr Munna Kumar Shah	Scientist E	mun*******@gov.in	Attended by Yogendra Pal Singh, Scientist 'E'

MINUTES OF THE 12TH MEETING OF THE EXPERT APPRAISAL COMMITTEE FOR RIVER VALLEY AND HYDROELECTRIC PROJECTS HELD ON 18TH – 19TH JULY, 2024 FROM 10:30 AM – 05:30 PM AT MOEF&CC, INDIRA PARYAVARAN BHAWAN, NEW DELHI.

The 12th meeting of the EAC for River Valley & Hydroelectric Projects organized by the Ministry of Environment, Forest and Climate Change, Indira Paryavaran Bhawan, Jor Bagh Road, New Delhi, was held on 18th – 19th July, 2024 through Physical mode, under the Chairmanship of Prof. G. J. Chakrapani. The list of Members present in the meeting is at **Annexure**.

Before taking up the agenda for discussion the EAC deliberated upon improving the quality of EIA/EMP reports. The chairman suggested that the Project Proponents may get the reports vetted by a no conflict third party reputed consultant.

Confirmation of Minutes of 11th EAC meeting

The EAC confirmed the minutes of 11th EAC meeting held on 27th June, 2024.

Agenda Item No. 12.1

Upper Sileru Open Loop Pumped Storage Project (1350 MW) in an area of 332.44 Ha at Village Valasagedda, Busikonda, Sub District Gudem Kotha Veedhi, District Alluri Sitharama Raju, Andhra Pradesh by M/s Andhra Pradesh Power Generation Corporation Limited– Reconsideration for Environmental Clearance (EC) - reg.

[Proposal No. IA/AP/RIV/456248/2023; F. No. J-12011/18/2019-IA.I (R)]

12.1.1: The proposal is for grant of Environmental Clearance (EC) to the project for Upper Sileru Open Loop Pumped Storage Project (1350 MW) in an area of 332.44 Ha at Village Valasagedda, Busikonda, Sub District Gudem Kotha Veedhi, District Alluri Sitharama Raju, Andhra Pradesh by M/s Andhra Pradesh Power Generation Corporation Limited.

12.1.2: 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 proposal is for environmental clearance for Upper Sileru Pumped Storage Project (9 x 150 MW) located at Upper Sileru, Gudem Kotha Veedhi (Mandal), Alluri Sitarama Raju (District), Andhra Pradesh by M/s. Andhra Pradesh Power Generation Corporation Limited.

ii. The proposed pumped storage project is located in Gudem Kotha Veedhi Mandal of district Alluri Sitarama Raju in the state of Andhra Pradesh. The project is situated close to Sileru village which is around 200 km from Visakhapatnam. The Proposed Project is located on Sileru River.

iii. The project envisages re-utilisation of water of the Guntawada reservoir which is presently being used for power generation at existing Hydro Electric Power Station and surplus spilled from the reservoir is proposed to be stored in Donkarayi reservoir located on the downstream side for reutilisation during pumping mode. The coordinates of Guntawada reservoir are 18o 03'34" North and 82o 02'18" East.

iv. The intake site is located at village Sileru, which is about 1.50 km from existing Guntawada Dam on Sileru River. The power house is located on the left bank of the Sileru River, which is about 2.50 km from Sileru village. The geographical co-ordinate of the project are Guntawada Reservoir (Upper) – Latitude 18°03'33"N, Longitude 82°02'15"E and Donkarayi Reservoir (Lower) – Latitude 17°56'02" N, Longitude 81°47'46"E. The coordinates of the proposed intake at the diversion site are 18°3'3.62" N and 82°2'17.53" E while that of the power house are 18°1'57.60" N and 82°1'15.23" E.

v. The project proposal was considered by the Expert Appraisal Committee (Hydro River Valley Sector) in its meeting held on 23.04.2019 and recommended for grant of Terms of References (ToRs) for the Project. The ToR has been issued by Ministry vide letter No. J-12011/08/2019-IA I(R) dated 03.06.2019

vi. The Upper Sileru Pumped Storage Project envisages construction of:

- About 138 m long approach channel designed to feed required quantum of water to three intake tunnels.
- Intake structure designed to draw required quantity of water through three headrace tunnels of 12 m diameter.
- Three (3) HRTs each of 12 m finished diameter and about 2,768 m length from downstream of Intake till upstream Surge shaft.
- An open to sky upstream Surge shaft about 2,768 m downstream of intake location.
- Surface powerhouse with deepest excavation level at El 265.0 m, service bay at El 330.00 m and centre line of pump/turbine at El 281.50 m about 350 m downstream of upstream surge shaft. Powerhouse will have nine pumps cum turbine of 150 MW each.
- Downstream surge shaft at 73.5 m downstream of powerhouse.
- Three (3) nos. of tailrace tunnels each of 12 m diameter and about 2,465 m length from downstream surge shaft up to outlet structure

vii. **Demographic details in 10 km radius of project area:**
District Alluri Sitarama Raju of state Andhra Pradesh and District Malkangiri of state Odisha will be the study area for the proposed project.

- Total Households - 7100
- Total Population - 29303
- Male Population - 14187
- Female Population - 15116
- Population<6 years - 5344
- Literacy Rate - 53.31%

viii. **Project Cost:** The estimated project cost is Rs. 11,154.39 Cr including existing investment of Rs 2402.53 crores. Total capital cost earmarked towards environmental pollution control measures is Rs 125.83 Cr and the Recurring cost (operation and maintenance) will be about Rs 142.13 Lakh per annum.

ix. **Project Benefit:** Total Employment will be 1100 persons during construction and 100 persons during Operation phase. The project proposes to allocate Rs 1,493.00 lakh @ of 0.125 % towards CER (as per Ministry's OM dated 2018).

x. **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 Sileru is flowing nearer in South West direction.

xi. **MoU / any other clearance/ permission signed with State government:**
GoAP accorded in principle approval on 19.10.2021 to establish the project by APGENCO.

xii. **Resettlement and rehabilitation:**
The Revenue Department has identified 22 Nos ROFR patta holders in Sandkori village, who are Project Affected Families (PAFs). The tentative cost estimate for the proposed Rehabilitation & Resettlement Entitlements is Rs. 360 lakh.

xiii. **Scheduled –I species**
Schedule-I species are not observed in the project area, however they are present in study area. Species are: Indian wolf, Ratel, Sloth bear, Four horned Antelope, Indian Chevrotain, Leopard Cat.

xiv. **Alternative site studies:**
Four alternatives have been studied:

- Alternative-1: Alignment of water conductor system as proposed in FR but with surface powerhouse located about 3000m from upper intake (in place of underground PH in FR)
- Alternative-2A: Project aligned towards left of Alternative 1 layout with HRT aligned towards APGENCO guesthouse/ hill side and planning a surface powerhouse located about 3600 m downstream of approach channel and open to sky surge shafts.
- Alternative-2B: Similar to alternative 2A, an underground powerhouse in place of surface powerhouse. The powerhouse location will be about 650 m upstream of surface powerhouse proposed in Alternative 2A.
- Alternative-3: Project aligned towards right of Alternative 1 with Intake located towards Guntawada weir and suitably aligning Water Conductor System/ Tunnels and planning a

surface powerhouse located about 4500m downstream of approach channel and open to sky surge shafts.

Salient features of all the alternatives are tabulated below:

Component	Length (m)			
	ALT-1	ALT-2A	ALT-2B	ALT-3
Approach Channel	138	193	193	148
Headrace Tunnel	2768	3031	2370	3959
Pressure Shaft	385	392	392	392
Draft Tube	73.5	209	209	209
Tailrace Tunnel	2465	2314	2975	2360
Total	**5829.50**	**6139**	**6139**	**7068**

Alternative 1

Alignment and length of water conductor system has been kept identical to the alignment adopted in FR. In place of underground powerhouse, transformer cavern and surge pool, a surface powerhouse with upstream and downstream surge pools is proposed. The powerhouse is proposed about 3325m downstream of intake location. Suitable adits for excavation of HRT, TRT, upstream and downstream surge pools and powerhouse will be required. Powerhouse excavation is expected to extend up to depth of 80m below natural ground level and will need adequate rock support planning. Total length of water conductor system in this alternative is 5829.50 m.

Alternative-2A

Approach channel is proposed close to the location in alternative 1 but with a length of about 193 m is envisaged as compared to the approach channel length of about 138 m in Alternative-1. It is anticipated that good geological condition for locating Intake site will be available at the end of approach channel in this alternative. Also, this layout provides adequate and safe rock cover for HRT although the length of HRT will be longer by about 263 m. This alternative also provides suitable location of upstream and downstream surge shafts as well as Surface Powerhouse at Ch 3600 m from approach channel. This alternative also involves about 309.5 m longer Water Conductor System in comparison to Alt-1 including 55 m longer approach channel, 263 m longer HRT and 151 m shorter TRT.

Alternative-2B

Approach channel, intake, HRT and TRT alignment is kept identical to Alternative 2A. In this alternative, an underground powerhouse is proposed in place of surface powerhouse in alternative 2A. Underground powerhouse is proposed about 660 m upstream relative to the proposed location of surface powerhouse in 2A.

Alternative-3

Approach channel is proposed in between the spillway of main dam and head regulator of existing powerhouse. Approach channel length of 148 m is proposed followed by 3959 m long

HRT and 2360 m long TRT. The total length of water conductor system in this alternative is about 7068 m. This alternative involves about 1238.5 m longer Water Conductor System in comparison to Alt-1 including 10 m longer approach channel, 1191 m longer HRT and 105 m shorter TRT. Availability of adequate rock cover for a part of HRT length exists based on the detailed topographic survey carried out in this area. In this alternative, the TRT will pass below the tailrace channel of existing powerhouse and adequate rock cover is available at the crossing based on topographical survey and geological investigation.

Conclusion

Out of above alternatives, Alternative 3 has the longest water conductor system and the TRT will pass below the tailrace channel of existing project. Therefore, this alternative is not considered suitable for development of Upper Sileru PSP.

Water Conductor system of Alternative 2A and 2B is longer as compared to water conductor system of Alternative 1 by about 309.5 m. Alternatives 2A/2B have the advantage of availability of adequate rock cover along entire length of water conductor system as well as availability of favourable geological condition for HRT excavation.

Alternative - 1 has the shortest water conductor system in addition to availability of adequate rock cover & favourable geological conditions and detailed topographical survey has been carried out along entire alignment of water conductor system. Accordingly, Alternative 1 is proposed to be adopted for further development and for planning of geological investigation. Project layout as per Alternative 1 has been optimized with respect to hydraulic, geological and structural stability.

xv. Details of Solid waste/ Hazardous waste generation/ Muck and its management
Municipal Solid Waste, Source: Labour camps, Qty (TPA): 244.55

Estimated Muck to be generated: Out of 82,14,023 cum of excavated muck, 4,19,900 cum of muck will be used in backfilling of coffer dam and 10,02,858 cum in concreting. Remaining quantity of muck (67,91,265 cum) shall be disposed at pre-designated muck disposal sites

xvi. Public Hearing for the proposed project has been conducted by the State Pollution Control Board on 01.04.2023 and the advertisement for conducting Public Hearing was published on 26.02.2023 in two newspapers i.e., “Sakshi” (Telugu) and “The Indian Express” (English). The Public Hearing meeting was chaired by Sri J. Shiva Srinivasu, IAS, Joint Collector & Additional District Magistrate, Alluri Sitarama Raju District. The main issues raised during the public hearing are related to

- 50 bedded Hospital in the project, free Medical facilities to local tribal people
- Employment for local people
- Repairs to R&B Road
- Education to local tribal people in DAV School
- Power Supply Interruptions
- R&R for Sandkori Villagers

xvii. The salient features of the project are as follows:-

1. EAC MEETING DETAILS

EAC meeting/s	12th Meeting of The Expert Appraisal Committee on River Valley Projects
Date of Meeting/s	18.07.2024
Date of earlier EAC meetings	EAC Meeting held on 23.04.2019 for grant of Terms of Reference EAC Meeting held on 09.02.2024 for grant of Environmental Clearance

2. Project Details

Name of the Proposal	Upper Sileru Pumped Storage Project (9 x 150 MW)
Proposal No.	IA/AP/RIV/456248/2023
Location (Including Coordinates)	Upper Sileru, Gudem Kotha Veedhi (Mandal), Alluri Sitarama Raju (District), Andhra Pradesh Guntawada Reservoir (Upper) – Latitude 18°03'33" N, Longitude 82°02'15"E Donkarayi (Lower) – Latitude 17°56'02" N Longitude 81°47'46"E
Company's Name	M/s Andhra Pradesh Power Generation Corporation Limited
CIN no. of Company/user agency	U40109AP1998SGC109187
Accredited Consultant and certificate no.	WAPCOS LIMITED, NABET/EIA/21124/RA0222 Validity: 24.07.2024
Project location (Coordinates /River/ Reservoir)	Upper Sileru, Gudem Kotha Veedhi (Mandal), Alluri Sitarama Raju (District), Andhra Pradesh Guntawada Reservoir (Upper) – Latitude 18°03'33" N, Longitude 82°02'15"E Donkarayi (Lower) – Latitude 17°56'02" N Longitude 81°47'46"E
Inter- state issue involved	No
Proposed on River/ Reservoir	Sileru River a tributary of Sabari River
Type of Hydro-electric project	Pumped Storage Project
Seismic zone	Zone- II

3. Category details:

Category of the project	A
Capacity / Cultural command area (CCA)	1350 MW
Attracts the General Conditions (Yes/No)	No
Additional information (if any)	-

4. ToR/EC Details:

ToR Proposal No.	IA/AP/RIV/101074/2019
EAC meeting date	23.04.2019
ToR Letter No.	F.No. J-12011/08/2019-IA I(R)
ToR grant Date	03.06.2019
Cost of project	Rs. 11,881.50 Crore (Incl. IDC) as per DPR Rs. 11,154.39 Crore (Incl. IDC) as per TEC Clearance
Total area of Project	326.47 ha
Height of Dam from Bed (EL)	-
Details of submergence area	Both upper and lower reservoirs are existing reservoirs
District to provide irrigation facility (if applicable)	Nil
Details of tunnels on upper level & lower level and length of canal (if applicable)	**HEAD RACE TUNNEL (HRT)** Type: Finished Modified Horse Shoe Diameter: 12 m Nos.: 3 Average Length: 2,768 m **PENSTOCK TUNNEL/PRESSURE SHAFTS** Type: Circular Steel Lined/ embedded pressure shaft independent Nos.: 9 Diameter: 6 m Length of each penstock: 385 m **TAIL RACE TUNNEL (TRT)** Type: Finished Modified Horse Shoe Diameter: 12 m Nos.: 3 Average Length: 2,465 m
No. of affected Village	1
No. of Affected Families	22
Project Benefits	Total energy generation of 3501.89 MU annually, Upliftment of Socio economic condition of Study area villages
R&R details	Yes, Yet to start
Catchment area/ Command area	Both upper and lower reservoirs are existing reservoirs
Types of Waste and quantity of generation during construction/Operation	Municipal Solid Waste Source: Labour camps Qty (TPA): 244.55 Construction Waste

	Source: Construction work Qty (TPA): 6063
Material used for blasting and its Composition as per DGMS standards.	Will be finalised during pre-construction market survey
E-Flows for the Project	Upper reservoir (Guntawada Reservoir) and Lower reservoirs (Donkarayi Reservoir) are under operation since 1980's. No additional diversion is envisaged, except for the losses, which is order of less than 0.5% in daily filling and emptying of reservoirs. Thus, no Environmental Flows are required for the proposed project.
Is Projects earlier studied in Cumulative Impact assessment & Carrying Capacity studies(CIA&CC) for River in which project located. If yes, then c) E-flow with TOR/Recommendation by EAC as per CIA&CC study of River Basin. d) If not the E-Flows maintain criteria for sustaining river ecosystem.	NA
Details on provision of fish pass	NA
Project benefit including employment details (no of employee)	During construction phase: 1100 During operation phase: 100
Area of Compensatory Afforestation (CA) with tentative no of plantation.	193.01 ha
Previous EC details	NA
EC Compliance Report by R.O, MOEF&CC	NA

5. Electricity Generation capacity

Powerhouse Installed Capacity	1350 MW
Generation of Electricity Annually	3501.89 MU
No. of Units	09 of 150 MW each

6. Muck Management Details:

No. of proposed disposal area/ (type of land- Forest/Pvt land)	2 (two) pre-designated muck disposal sites
Cross section of proposed muck area, Height of muck with slope.	-
Distance of muck disposal area(location), from muck generation sources (project area)/River, HFL of proposed muck	-
Total Muck Disposal Area	74.58 ha

Estimate Muck to be generated	Out of 82,14,023 cum of excavated muck, 4,19,900 cum of muck will be used in backfilling of coffer dam and 10,02,858 cum in concreting. Remaining quantity of muck (67,91,265 cum) shall be disposed at pre-designated muck disposal sites
Transportation	By road
Monitoring mechanism for Muck Disposal	Enclosed in EIA/EMP report

7. Land Area Breakup:

Private land	-
Government land/Forest Land	193.01 Ha, Forest Land 133.46 ha, Govt Land (APGENCo)
Submergence area/Reservoir area	-
Land required for project components	326.47 Ha

8. 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	
National Park	No	
Wildlife Sanctuary	No	
Archaeological sites monuments/historical temples etc	No	
Additional information (if any)	No	

Availability of Schedule-I species in study area: Schedule-I species are not observed in the project area, however present in study area.

9. Public Hearing (PH) Details

Advertisement for PH with date	26.02.2023
Date of PH	01.04.2023
Venue	At APGENCO grounds (at Proposed site Upper Sileru (V), Gudem Kotha Veedhi (M), Alluri Sitarama Raju district, Andhra Pradesh
Chaired by	Joint collector and Addl. Dist. Magistrate ASR District, A.P
Main issues raised during PH	• 50 bedded Hospital in the project, free Medical facilities to local tribal people • Employment for local people • Repairs to R&B Road • Education to local tribal people in DAV

	School • Power Supply Interruptions • R&R for Sandkori Villagers
No. of people attended	74

10. Brief of base line Environment

Particulars	**Details**
Period of baseline data collection/ Sampling period.	01/11/2020 To 31/08/2021, All three seasons.
(Air, noise, water, land)	**Air: PM_{10}, $PM_{2.5}$, SO_2 and NO_2**

Parameter	Winter Season (µg/m^3)	Pre-monsoon Season (µg/m^3)	Monsoon Season (µg/m^3)	Permissible Standards (µg/m^3)
PM_{10}	37.98 - 62.51	37.86 - 61.88	39.46 - 51.2	100
$PM_{2.5}$	21.38 - 34.59	21.43 - 34.10	19.17 - 25.81	60
NO_2	19.86 - 34.96	20.33 - 35.70	17.9 - 23.07	80
SO_2	7.14 - 8.06	6.63 - 8.08	6.75 - 7.76	80

Noise: Equivalent day time and night time noise level

Season	Day Time Equivalent Noise level dB(A)	Permissible Standards dB(A)
Winter	44.6 to 45.7	55
Pre-monsoon	43.6 to 44.6	55
Monsoon	41.40 to 43.20	55

Surface Water: Physico-chemical and biological parameters

Parameter	Winter Season	Pre-monsoon Season	Monsoon Season	Drinking Water Quality Standards
pH	6.03 to 6.79	5.90 to 7.2	5.5 to 7.29	7.0 - 8.5
Electrical Conductivity (µS/cm)	34.9 to 85.7	34.2 to 85.4	32.2 to 92.4	-
Total Hardness (mg/l)	12 to 24	12 to 30	19 to 35	200
BOD (mg/l)	16.22 - <0.01	16.22 - <0.4	10 - <0.4	-
COD (mg/l)		16.22 - <0.01	11 - <0.01	-

- The heavy metal concentration in the study area is below the permissible limit used for drinking purposes

Soil Quality:

Parameter	Winter season	Pre-monsoon season	Monsoon season
pH	6.08 to 7.15	6.02 to 7.17	6.00 to 7.10
Electrical Conductivity (µS/cm)	0.013-0.072	0.010-0.081	0.005-0.069
Texture	Sandy clay	Sandy clay	Sandy clay

flora and fauna of the project area,

Flora

Dominant tree species found in this forest were- *Acacia auriculiformis, Aegle marmelos, Albizia odoratissima, Azadirachta indica, Bombax ceiba, Eucalyptus globulus, Ficus racemosa, Gymnocladus dioica, Haldina cordifolia, Holarrhena pubescens, Syzygium cumini and Tectona grandis*

Dominant shrub species were- *Chromolaena odoratum, Clerodendrum infortunatum, Combretum decandrum, Lantana*

	camara, Mimosa hamata, Phoenix sylvestris and Zizyphus mauritiana. Dominant herbs were- *Achyranthes aspera, Ageratum conyzoides, Alternanthera sessilis, Corchorus aestuans, Cynodon dactylon, Nicotiana plumbiginifolia, Persicaria barbata, Saccharum spontaneum and Vetiveria zizanioides* **Fauna:** **Mammals** A total of 32 mammalian species of 16 families were recorded from study area. Jackal, Jungle Cat, Mongoose, Spotted Deer, Wild Boar, Rhesus Macaque, Hanuman Langur are common in area **Avi-Fauna** Common species included Blue Rock Pigeon, Spotted Dove, Speckled Piculet, Red-whiskered Bulbul, Red-vented Bulbul, Blyth's Reed-Warbler, Greenish Leaf-Warbler, Brook's Flycatcher, Brown Shrike, Purple-rumped Sunbird, Spotted Munia, White-rumped Munia, Little Brown Dove, Jungle Crow and House Sparrow. **Herpetofauna** *Garden Lizard, Brooke's House Gecko, Monitor Lizard, Keeled India Mabuya, Speckled Cobra, Trinket Snake, Indian Bullfrog, and Indian Skipper Frog were common species of the study area.* **Butterfly** *Eurema hecabe, Junonia lemonias, Ypthima huebneri, Euploea core, Neptis hylas, Danaus chrysippus, Euthalia aconthea* and *Precis iphita* were most common species in the Study area
aquatic ecology, etc	A total of 65 benthic diatoms were recorded from all sites of study area *Achnanthes gibberula, Fragilaria pinnata, Navicula rhynchocephala*, and *Cymbella rupicola* were most common taxa recorded from all the sites *Cinygma* sp. and *Hydroporus* sp. were relatively common taxa, recorded from most of sites. **Fisheries** *Notopterus notopterus, Catla catla, Cirrhinus mrigala, Labeo rohita, Garra mullya, Mystus vittatus, Mastacembelus pancalus, Channa punctata,* and *Channa gachua* were predominant fish species of the region.
Brief description on hydrology and water assessment as per the approved pre-DPR:	No new dam is proposed and the water demand will be met from existing Guntawada and Donkarayi reservoirs. 1.7 TMC of water will be used from Guntawada Reservoir for PSP in generation mode during peak hours and the same quantity of water will be pumped back from Donkarayi Reservoir to Guntawada Reservoir during off-peak hours.

	1.7 TMC of water required for PSP is one-time requirement only.

11. Court cases details: NIL

12. Status of other statutory clearances

Particulars	Letter no. and date
Status of Stage- I FC	Application submitted, In process Proposal No. FP/AP/HYD/IRRIG/423651/2023, Dated: 23.11.2023
Approval of Central Water Commission	<table><tr><th>Aspect</th><th>Status</th></tr><tr><td>General layout</td><td>Concurrence received on 14.08.2020</td></tr><tr><td>Hydrological studies</td><td>Concurrence received on 24.06.2020</td></tr></table>
Approval of Central Electricity Authority	PPS studies Concurrence received on 05.01.2021 TEC accorded by CEA vide File No.CEA-SY-25-24/1/2020-PAC Division-Part(1), dt.13.06.2023
Additional detail (If any)	Nil
Is FRA (2006) done for FC-I	Yes, ROFR Certificate issued by the District Collector

13. Details of the EMP

The total amount to be spent for various measures recommended in Comprehensive EIA report would be Rs.127.72 crore and recurring expenses will be Rs 142.13 Lakh/Year.

S. No.	Item	Cost (Rs. lakh)
1.	**Capital Expenditure**	
A. Mitigation Measures		
1.	Stabilization of Muck Disposal Sites	710.0
2.	Solid waste Management	45.73
3.	Environmental Management in Road Construction	500.0
4.	Control of Water Pollution	375.0

S. No.	Item	Cost (Rs. lakh)
5.	Control of Air Pollution	114.3
6.	Control for Noise Pollution	29.0
7.	Provision of Free Fuel	430.34
8.	Compensatory Afforestation	1698.49
9.	Biodiversity Conservation Plan	127.0
10.	Wildlife protection Plan	258.6
11.	Habitat Improvement for Avi-fauna	28.00
12.	Fisheries Management Plan	102.56
13.	Public Health Delivery System	197.7
	Sub-Total (A)	**4616.72**
B. Additional Measures		
14.	Rehabilitation and Resettlement	360.00
15.	Corporate Environmental Responsibility	1493.00
16.	Local Area Development Plan	5222.00
17.	Additional commitments during Public Hearing	507.0
	Sub-Total (B)	**7582.0**
C. Environmental Management Plan		
18.	Strengthening of existing CAT Plan	60.0
19.	Greenbelt Development Plan	50.0
20.	Energy Conservation Measures	40.0
21.	Public Awareness Programme	50.0
22.	Disaster Management Plan	60.0
	Sub-Total (C)	**260.0**
D. Environmental Monitoring Programme		
22.	Implementation of Environmental Monitoring Programme during construction stage	124.0
	Sub-Total (D)	**124.0**
	Grand Total (A+B+C+D)	**12582.72 lakh, say, Rs. 125.83 crore**
2. Recurring Expenses		
		Cost (Rs. Lakh/year)
1	Environmental Monitoring Programme during Operation phase	54.13
2	Educational Loan	88.0
	Total	**142.13**

12.1.3 The Proposal was earlier considered by the EAC in its 7th meeting held on 09.02.2024 wherein the EAC deferred the proposal as the project proponents and consultants failed to present their proposal effectively due to poor internet connectivity. Accordingly, the PP vide its reply dated 11.06.2024 re-submitted the proposal along with Interstate Clearance Letter, Executive Summary of Revised CEIA Report and Revised CEIA Report.

12.1.4 The EAC during deliberations noted the following:

- The EAC deliberated on the information submitted and as presented in the meeting and observed that the proposal is for grant of Environmental Clearance to the project for Upper Sileru Open Loop Pumped Storage Project (1350 MW) in an area of 332.44 Ha at Village Valasagedda, Busikonda, Sub District Gudem Kotha Veedhi, District Alluri Sitharama Raju, Andhra Pradesh by M/s Andhra Pradesh Power Generation Corporation Limited.

- The project is listed at S.N.1(c) of the Schedule to the Environment Impact Assessment (EIA) Notification under category 'A' and are appraised at Central Level by Expert Appraisal Committee (EAC).

- The EAC, constituted under the provision of the EIA Notification, 2006 comprising Expert Members/domain experts in various fields, examined the proposal submitted by the Project Proponent in desired format along with EIA/EMP reports prepared and submitted by the Consultant accredited by the QCI/ NABET on behalf of the Project Proponent.

- The EAC noted that the Project Proponent has given an undertaking that the data and information given in the application and enclosures are true to the best of his knowledge and belief and no information has been suppressed in the EIA/EMP reports. If any part of data/information submitted is found to be false/ misleading at any stage, the project will be rejected and Environmental Clearance given, if any, will be revoked at the risk and cost of the project proponent.

- The Committee noted that the EIA reports are in compliance of the ToR issued for the project, reflecting the present environmental status and the projected scenario for all the environmental components. The Committee deliberated on the proposed mitigation measure towards Air, Water, Noise and Soil pollutions. The Committee suggested that the storage of toxic/explosive raw materials/products shall be undertaken with utmost precautions and following the safety norms and best practices.

- The Terms of References (ToRs) has been issued by Ministry vide letter No. J-12011/08/2019-IA I(R) dated 03.06.2019. The EAC noted that total land area required for the project is 326.47 Ha out of which 133.46 ha is Govt Land and 193.01 Ha is a Forest Land for which Stage-1 FC is still under process in the Ministry. The estimated project cost is Rs. 11,154.39 Cr including existing investment of Rs 2402.53 crores. Total capital cost earmarked towards environmental pollution control measures is Rs 125.83 Cr and the Recurring cost (operation and maintenance) will be about Rs 142.13 Lakh per annum.

- The Committee deliberated on the Public Hearing (PH) issues along with action plan submitted by the proponent to address the issues raised during the public hearing and found it satisfactory. The committee advised the PP to implement the PH action plan in a time bound manner. In view of presence of tribal population in the study area the EAC felt the need for establishing Skill Development Centres for locals, promotion of local tribal products through proper marketing for the same under supervision of Project Proponent. The Committee was also of the view that PP should bear the responsibility to provide amenities like setting up

schools, solar panel, computer with internet facility in schools, pure drinking water facility for overall upliftment of tribal population.

12.1.5 The EAC after examining the information submitted and detailed deliberations **recommended** the proposal for grant of Environmental Clearance by the Ministry to Upper Sileru Open Loop Pumped Storage Project (1350 MW) in an area of 332.44 Ha at Village Valasagedda, Busikonda, Sub District Gudem Kotha Veedhi, District Alluri Sitharama Raju, Andhra Pradesh by M/s Andhra Pradesh Power Generation Corporation Limited, under the provisions of EIA Notification, 2006 and as amended with subject to compliance of applicable Standard EC conditions with the following additional conditions:

[A] Environmental management and Biodiversity conservation:

i. The water of rainfall yield of self-catchment of the reservoir shall be released to downstream through body of dam/ barrage/ embankment etc.
ii. The water for filling of reservoir/ recoupment of evaporation and recirculation losses shall be met from a source other than the rainfall yield of catchment of non-perennial stream/ nallah.
iii. The Environmental Management Plan (EMP) shall be strictly adhered to as submitted in the EIA/EMP reports. The budgetary provisions for implementation of EMP, shall be fully utilized and not to be diverted to any other purpose. In case of revision of the project cost or due to price level change, the cost of EMP shall also be updated proportionately.
iv. The contract clause limiting the No. of vehicles used during excavation and transportation shall followed scrupulously and the same shall informed to the ministry.
v. Ambient Air Quality Monitoring Stations for real time data to be installed at project site before commencement of the construction, shall be displayed at project site and its report to be submitted to IRO, MoEF&CC.
vi. No vehicle purchase shall be allowed from funds earmarked for implementation of Wildlife Conservation plan. Measures for minimizing the human–animal conflict specially for black bear and leopard be suitably incorporated in the wildlife conservation plan in consultation with State Forest Department.
vii. 10000 plants shall be planted around the muck disposal area and the survival of plants shall be submitted with the 6 monthly compliance report.
viii. Watershed development plan shall be prepared in consultation with ICAR/expert Govt. institute and be implemented within 10 km radius of the project. Implementation status be submitted in the 6 monthly compliance report to the concerned regional office of the Ministry.
ix. Plant Nursery for Red Senders (Pterocarpus santalinus) shall be developed and 1000 Red Senders saplings/year shall be planted along the watershed areas within 10 km radius of the project.

[B] Disaster Management:

i. Disposal of the excavated muck and its filling on the low-lying area with proper measures for the stabilization and greenery to minimize the impacts of the generated construction muck shall be taken up pari passu with construction work.

ii. Stabilization of muck disposal sites using biological and engineering measures shall be taken up immediately to ensure that muck does not roll down the slopes and does not pollute the natural streams and water bodies in surrounding area. The plantation on muck disposal site with local species for restoration of ecology and environment of the project site area.
iii. Necessary control measures such as water sprinkling arrangements, and construction of paved roads leading to muck disposal sites etc. shall be taken up on priority to arrest fugitive dust at all the construction sites.
iv. Solid waste generated, especially plastic waste, etc. should not be disposed of as landfill material. It should be treated with scientific approach and recycled. Use of single-use plastics may be discouraged.

[C] Socio-economic:

i. Land acquired for the project shall be suitably compensated in accordance with the prevailing guidelines of the state government and provisions under Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013.
ii. RO plant shall be installed in the nearby 5 villages and the maintenance shall be done by the project Authorities.
iii. Solar panel be provided to the families living in rural areas within 10 km radius of project.
iv. School up to 12^{th} Standard shall be established to provide quality education for children from Tribal villages.
v. The compliance of above conditions shall be monitored by IRO, MoEF&CC and regularly site visit once in year. The compliance report of IRO shall be regularly submitted to MoEF&CC.
vi. 50 bed multi-speciality hospital shall be established to cater the need of tribal population/locals. The tribal population within 10 km radius of the project shall be given free of cost medical facility.
vii. Skill development Centre shall be established within 10 km radius of the project and regular training programmes for development and promotion of traditional art/products of tribal population.
viii. The area is ecologically fragile therefore Project Proponent shall ensure that safety measures as mentioned in the EMP shall be fully implemented.

[D] Miscellaneous:

i. After 5 years of the commissioning of the project, a study shall be undertaken regarding impact of the project on the environment. The study shall be undertaken by an independent agency.
ii. Bio-Gas plant (Deenn Bandhu Model of Bio-Gas) shall be installed in the Project affected area for Utilizing Cattle waste (Cow Dung) into renewable source of fuel.
iii. PP should establish in house (at project site) environment laboratory for measurement of environment parameter with respect to air quality and water (surface and ground). A dedicated team to oversee environment management shall be setup which should comprise

of Environment Engineers, Laboratory chemist and staff for monitoring of air, water quality parameters on routine basis.

iv. PP shall procure construction material only from those Organizations having all valid legal/statutory clearances/permissions or necessary permission to be obtained for quarrying construction materials for the project as per the EIA Notification, 2006 and as amended thereof.

v. An institutional mechanism to be developed to ensure the preference of jobs to PAFs and also a policy for preferential treatment for award of sundry works to the PAFs and their dependents.

Agenda Item No. 12.2:

Jhariya Pumped Storage Project (1620 MW), in an area of 333.97 ha. located at Village Badarwa, Tehsil Robertsganj, District Sonbhadra, Uttar Pradesh by M/s Jhariya Ananturja Private Limited – Terms of References (TOR) - reg.

[Proposal No. IA/UP/RIV/471860/2024; F. No. J-12011/13/2024-IA-1(R)]

12.2.1: The proposal is for grant of Terms of References (ToR**)** to the project for Jhariya Pumped Storage Project (1620 MW), in an area of 333.97 ha. located at Village Badarwa, Tehsil Robertsganj, District Sonbhadra, Uttar Pradesh by M/s Jhariya Ananturja Private Limited.

12.2.2: 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 ToR to the project for Jhariya Pumped Storage Project (1620 MW), in an area of 333.97 ha. located at Village Badarwa, Tehsil Robertsganj, District Sonbhadra, Uttar Pradesh by M/s Jhariya Ananturja Private Limited.

ii. The geographical co-ordinate of the project are Lower Reservoir: 83°13'46.87"E; 24°30'11.50"N; Upper Reservoir: 83°13'30.51"E; 24°31'18.33"N. The Jhariya Pumped Storage Project envisages construction of two artificial reservoirs near Jhariya village in Robertsganj Tehsil of Sonbhadra District of UP.

iii. The scheme is proposed with an installed capacity of 1620 MW located in the Robertsganj Tehsil of Sonbhadra district of Uttar Pradesh. The Project envisaged construction of two artificial reservoirs; Upper reservoir and Lower reservoir near village Jhariya in the Sonbhadra district of Uttar Pradesh.

iv. Water requirement: Jhariya PSP (1620 MW) will require 17.96 MCM for initial reservoir filling and thereafter ~ 2.47 MCM per year will be required on annual basis from Sone River for restoring the storage capacity lost due to evaporation.

v. **Project Cost:** The estimated project cost is Rs 7374.57 crore. Total capital cost earmarked towards environmental pollution control measures will be worked out during EIA study

as well as the Recurring cost (operation and maintenance).

vi. Project Benefit: Total Employment will be 660 persons as direct & persons indirect after expansion.

vii. Environmental Sensitive area: Kaimur WLS (UP) is located about 8.0 Km, however, proposed project is outside the notified ESZ boundary of the sanctuary. River/ water body, Sone River is flowing at the aerial distance of 0.5 km in west to east direction.

viii. MOU has been signed between Government of Uttar Pradesh and M/s Jhariya Ananturja Pvt. Ltd. to build PSP with a capacity of 1620 MW vide MoU No. 23/REN/0000024785 dated August 19, 2023.

ix. Alternative Studies: Three options are considered for upper reservoir at alternative locations and compared.

S. No.	Reservoir Parameters	Upper Reservoir			
		Option-1A	Option-1B	Option-2	Option-3
1	Dam Top (m)	564	564	**569**	536
2	FRL (m)	560	560	**565**	531
3	MDDL (m)	543	543	**547**	513
4	Excavated bed Level (amsl)	542	542	**546**	511
5	Max. dam Height (m) above deepest ground	35	35	**33**	33
6	Weighted average dam height (m)	16.3	16.3	**19.8**	21.5
7	Length of Dam (m)	3585.1	3578.33	**2683.63**	2795
8	Area of reservoir (Ha)	94.25	94.78	**87.95**	99
9	Gross Storage Capacity (MCM)	13.42	13.5	**13.8**	13.8
10	Live Storage (MCM)	12.72	12.8	**12.41**	12.52
11	Total Excavation quantity (Lakh m^3)	51.35	51.71	**36.5**	38.6
12	Rock Excavation quantity (Lakh m^3)	31.2	34.64	**31.56**	25.9
13	Overburden soil (Lakh m^3)	7.8	8.66	**4.91**	12.7
14	Material requirement for Dam (Lakh m^3)	18.9	18.86	**20.01**	24

Four options are considered for lower reservoir at alternative location and compared

	Reservoir Parameters	Lower Reservoir

S. No.		Option-1A	Option-1B	Option-2	Option-3	Option-4
1	Dam Top (m)	245	245	**243**	235	225
2	FRL (m)	240	241	**239**	230	220
3	MDDL (m)	223	223	**220**	212	199
4	Excavated bed Level (amsl)	222	222	**219**	210	197
5	Max. dam Height (m) above deepest ground	36	36	**34**	26	34
6	Weighted average dam height (m)	16.6	16.6	**16**	13	18.6
7	Length of Dam (m)	3428.1	3207.21	**3420**	2953	1265
8	Area of reservoir (Ha)	105.2	99.64	**94.92**	94.25	81.05
9	Gross Storage Capacity (MCM)	15.99	15.54	**16.45**	15.97	16.11
10	Live Storage (MCM)	15.15	14.76	**14.95**	14.45	14.55
11	Total Excavation quantity (Lakh m^3)	51	38.25	**46.6**	66.1	48.0
12	Rock Excavation quantity (Lakh m^3)	44.39	31.43	**38.71**	54.2	39.4
13	Overburden soil (Lakh m^3)	6.61	6.9	**7.86**	11.9	8.64
14	Material requirement for Dam (Lakh m^3)	18.73	17.52	**17.56**	10.65	8.5

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

- **EAC Meeting Details:**

EAC meeting/s	12th Meeting
Date of Meeting/s	18.07.2024
Date of earlier EAC meetings	Nil

- **Project details:**

Name of the Proposal	Jhariya Pumped Storage Project
Location (Including coordinates)	Lower Reservoir : 83°13'46.87"E; 24°30'11.50"N

	Upper Reservoir : 83°13'30.51"E; 24°31'18.33"N
Inter- state issue involved	No
Seismic zone	Zone-II

- **Category details:**

Category of the project	A
Provisions	
Capacity / Cultural command area (CCA)	1620 MW
Attracts the General Conditions (Yes/No)	Yes
Additional information (if any)	Nil

- **Electricity generation capacity:**

Powerhouse Installed Capacity	1620 MW
Generation of Electricity Annually	3404.0 MU
No. of Units	7 nos. (5X270 MW+2X135 MW)
Additional information (if any)	Nil

- **ToR/EC Details:**

Cost of project	7374.57 Cr.
Total area of Project	333.97 ha
Height of Dam from River Bed (EL)	Lower Dam – 34.0 m Upper Dam – 33.0 m
Length of Tunnel/Channel	1583.97 m
Details of Submergence area	194.78 ha
Types of Waste and quantity of generation during construction/ Operation	Muck from excavation, solid waste from labour colony and construction waste
E-Flows for the Project	Not Applicable, as this is Off-Stream Closed Loop Pumped Storage Project (PSP)
Is Projects earlier studies in Cumulative Impact assessment & Carrying Capacity studies (CIA&CC) for River in which project located. If yes, then E-flow with TOR /Recommendation by EAC as per CIA&CC study of River Basin. If not the E-Flows maintain criteria for sustaining river ecosystem.	No

- **Muck Management Details:**

No. of proposed disposal area/ (type of land- Forest/Pvt. land)	90.0 ha Non-Forest Land
Muck Management Plan	Will be Provided in EIA/EMP report
Monitoring mechanism for Muck Disposal	Will be Provided in EIA/EMP report

- **Land Area Breakup:**

Private Land	153.05 ha
Government land/Forest Land	180.92 ha
Submergence area/Reservoir area	194.78 ha
Land required for project components	139.19 ha
Additional information (if any)	Nil

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

Forest Land/ Protected Area/ Environmental Sensitivity Zone		**Details of Certificate / letter/ Remarks**
Reserve Forest/Protected Forest Land	--	Distance from nearest protected area (Kaimur WLS; UP) is 8.0 Km, however, proposed project is outside the notified ESZ boundary of the sanctuary.
National Park	--	
Wildlife Sanctuary	--	

- **Court case details: NIL**

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

Particulars	**Letter no. and date**
Certified EC compliance report (if applicable)	Not Applicable
Status of Stage- I FC	Yet to Apply
Additional detail (If any)	Nil
Is FRA (2006) done for FC-I	Yet to Apply

- **Miscellaneous**

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

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

	○ Balancing generation driven variations ○ Voltage support and grid stability Apart from this, proposed PSP will also benefit the local community by creating employment opportunities and will result in upliftment of livelihood and socio-economic conditions.
Status of other statutory clearances	Forest Clearance - Online application seeking forest diversion for around 180.92 Ha after receipt of ToR Approval. Alongside, other statutory clearances (as applicable) from State as well as Central government will be obtained post completion of Detailed Project Report.
R&R details	Details shall be evaluated during EIA/EMP Studies
Additional detail (If any)	Nil

12.2.4 The EAC during deliberations noted the following:

The EAC deliberated on the information submitted (Form 1, PFR, kml file, etc.) and as presented in the meeting and observed that the proposal is for grant of terms of reference to the project for Jhariya Pumped Storage Project (1620 MW), in an area of 333.97 ha. located at Village Badarwa, Tehsil Robertsganj, District Sonbhadra, Uttar Pradesh by M/s Jhariya Ananturja 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 total land requirement for the project is 333.97 Ha out of which forest land is 180.92 ha and Non-forest land is 153.05 ha. The application for Stage-I forest clearance is yet to be obtained.

The EAC noted that more than Five PSP projects are proposed to be installed in close vicinity and source of water for all projects is Son River. In view of cascade development of PSP projects in the region the EAC was concerned about its impact on topography and water availability for sustaining the river eco-system, as the SON River is not a snow feed river it receives water from its catchment during monsoon season only, if the water channels/ rivulets available in the catchment gets disturbed due to excessive development of such projects, the sustainability of the river may be adversely affected. Flow health assessment and cumulative impact assessment & carrying capacity study of Son River is the utmost requirement for taking up Pumped Storage Projects in the river basin.

12.2.4 The EAC based on the information submitted and as presented during the meeting, **recommended** the proposal for grant of Standard ToR for conducting EIA study with Public consultation to the project for Jhariya Pumped Storage Project (1620 MW), in an area of 333.97 ha. located at Village Badarwa, Tehsil Robertsganj, District Sonbhadra, Uttar Pradesh by M/s Jhariya Ananturja Private Limited, under the provisions of EIA Notification, 2006, as amended along with the following additional/specific ToR.

[A] Environmental Management and Biodiversity Conservation:

i. Forest Division of the Ministry and State Government while appraising Forest Clearance, shall take into account the richness of biodiversity and pristine forest area to take appropriate decision.
ii. Explore the possibilities for reducing the Forest land requirement. The application for obtaining Stage I FC for 180.92 Ha of forest land involved in the project shall be submitted.
iii. Certificate and certified map from Chief Wildlife Warden shall be submitted mentioning that project boundary is not falling in any Ecological Sensitive Area, Wildlife Sanctuary/Tiger/elephant corridor/Critically polluted area within 10 km of Project site.
iv. PP shall submit the detailed plan for filling the reservoir in 2 years for generating envisaged capacity with excess monsoon water only.
v. No Objection Certificate from State of Jharkhand and Bihar as there may be genuine concern of downstream consumers to avoid scarcity of water to consumers. The availability of water in the river shall be submitted by Project Proponent certified by the Central Water Commission and State Water Resources Department.
vi. Transportation Plan for transporting construction materials shall be submitted. Separate chapter for risk assessment of such transportation through/within the Wildlife Sanctuary shall be included in the EIA report.
vii. Environmental Cost Benefit Analysis shall be done in terms of loss of Forest ecosystem due to diversion of Forest land/loss of biodiversity, water availability, water uses for generation of hydro power and Ecological flows.
viii. Calculation and values of GHGs (CO_2, CH_4 etc.) emissions during construction and during operation till the life of the project shall be estimated and submitted.
ix. The longitudinal connectivity/Free flowing sketch be provided in the EIA/EMP report. Presence of any critical mineral zone in the proposed area be clarified from GSI.
x. Quantitative values of Impact modelling of environmental parameters shall be submitted for during construction and operation. Also, mitigation measures shall be submitted in terms of construction and operation phase.
xi. Conducting site specific ecological study with respect to riverine ecology focus on fishes diversity, fish migration, habitat and aquatic biota due to construction PSP. Impact assessment on the fish diversity based on the hydrological alteration at the water drawing sources Sone River shall be studied.
xii. Cumulative Impact of project on carrying capacity and sustainability of Reservoir/ Sone River /nala of catchment area / due to tapping of water for filling reservoir.
xiii. Action plan for survival or diversion of the rivulets/stream leading to join Sone river shall be submitted.
xiv. Impact zone decided prior to base line data generation and accordingly, sampling location shall be finalized. Baseline data as mentioned in Standard ToR shall be collected for preparation of EIA/ EMP report along with soil characteristics which shall be studied at minimum 10 locations. The ground water level at 10 locations shall be measured in project area in all three seasons.
xv. A study shall be carried out on impact of project activity on the aquatic and terrestrial ecosystem, within project area classifying the impact zones (highly impact/low impact zone) based on seasonal variations and covering the aspects related to impacts on aquatic ecosystem/ primary productivity due to quantity of water to be lifted for power generation

and thermal stratification. Accordingly, Environment Management plan shall be prepared.

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

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

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

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

[B] Socio-economic Study

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

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

xxii. 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.

xxiii. Land acquired for the project shall be suitably compensated in accordance with the law of the land with the prevailing guidelines. Private land shall be acquired as per provisions of Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013.

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

[C] Muck Management/ Disaster Management

xxv. 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.

xxvi. 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.

xxvii. 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.

xxviii. Restoration plan for construction area including dumping site of excavated materials by

levelling, filling up of burrow pits, landscaping etc.

[D] Disaster Management

xxix. 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.

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

[E]Miscellaneous

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

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

xxxiii. 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.

xxxiv. Drone video of project site shall be recorded and to be submit.

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

xxxvi. Detailed plan to restore wider roads and convert them into narrow upto 10m after construction of the project. vii Specific Terms of Reference (ToRs) issued by the Ministry vide Office Memorandum No. F. No. IA3-22/33/2022-IA.III dated 14.08.2023 for Pumped storage projects shall be used for preparation of EIA/ EMP reports.

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

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

<u>Agenda Item No. 12.3:</u>

Rouni Open Loop Pumped Storage Project (2100 MW) in an area of 370 ha at Village Bhadikona, Chhichhli and Rajpuri R F, Sub-district Bagicha, District Jashpur, Chhattisgarh by M/s Chhattisgarh State Power Generation Company Limited– Reconsideration for Terms of References (TOR) - reg.

[Proposal No. IA/CG/RIV/460323/2024; F. No. J-12011/10/2024-IA.I(R)]

12.3.1: The proposal is for grant of Terms of References (TOR) Rouni Open Loop Pumped Storage Project (2100 MW) in an area of 370 ha at Village Bhadikona, Chhichhli and Rajpuri R F, Sub-district Bagicha, District Jashpur, Chhattisgarh by M/s Chhattisgarh State Power Generation Company Limited.

12.3.2: 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 proposal is for grant of ToR to the project for Rouni Open Loop Pumped Storage Project (2100 MW) located at Village Bhadikona, Rouni, Chhichhli and Rajpuri, Tehsil Bagicha, District Jashpur, Chhattisgarh by M/s. WAPCOS Limited.

ii. The proposed Lower Reservoir Rouni Pumped Storage project is located at Gangjaria Basti (Rouni road) of Bagicha Nagar Panchayat of Jashpur district, Chhattisgarh on Dorki Nala, a tributary of Ib/Mahanadi and the proposed upper Reservoir Rouni pumped storage Project is located near Chicholi village of Rouni Gram panchayat of Jashpur district, Chhattisgarh.

iii. The Geographical Co-ordinates of the project are N - 23°3'16.01", E - 83°37'3.92" for Upper Reservoir and N - 23°1'1.78" & E- 83°38'11.86" for Lower Reservoir. It is located 94 KM towards North West direction from District headquarters of Jashpur. The proposed Upper as well as lower reservoir are accessible at present through a District Road at 14 km and 7 km from Bagicha Main Road respectively

iv. The details of the project components are as follows:

- Upper dam (Bund type) is 4200m long rock-fill dam with clay core with maximum height of 22m.
- Lower concrete dam 515m long is to be constructed to impound the water in Dorki Nala with height of 60m
- 2 no. main intakes are proposed for two HRT's of 10.60m ϕ of 80m long water conductor system.
- 2 nos. pressure shaft of 8.8m ϕ connecting intake to power house
- Pressure shaft bifurcates after drop into 3 nos. smaller diameter penstock of 5.1 ϕ.
- Underground power house cavern housing 6 no. unit of 350 MW reversible Francis pump turbine.
- Transformer cavern is located d/s of power house cavern.
- 2 no. TRT (Concrete lined) of 10.60m ϕ connecting Power house to Lower reservoir.
- To facilitate the construction and operation of the project components, suitable adits and access roads have been proposed.

v. The Rouni Pumped Storage Project envisages construction of Upper dam, intake, Head race tunnel, pressure tunnel, penstock, powerhouse, transformer hall, tail race tunnel, outlet and Lower dam.

vi. **Land requirement:**

Forest Land	74.14 Hectares
Submergence area/Reservoir area	216.54 Hectares
Land required for project components	327.68 Hectares (Say 328 Ha)

vii. **Water requirement:** Approx. 550 KLD During construction stage; Approx. 120 KLD During Operational stage

viii. **Project Cost:** The estimated project cost is **₹7643.87 Crores** at Feb, 2023 price level. The preliminary cost estimate of the project has been prepared as per guidelines of CEA / CWC. The Abstract Summary of the cost estimates is given below

Item	**Estimated Cost (₹ Crores)**
Civil Works	4064.69
Electro-mechanical Works	3579.18
Total	**7643.87**

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.

x. **Resettlement and rehabilitation:**
In Rouni site approx. 125 - 140 households are affected in the project area as per the preliminary study and the details are as below.

1. U/R – 50-55 Households
2. L/R – 45-50 Households
3. WCS & PH – 30-35 Households

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

- **Project Details:**

Name of the Proposal	Rouni Open Loop Pumped Storage Hydro-electric Project (2100 MW)
Location (Including coordinates)	Near Bhadikona, Rouni, Chhichhli and Rajpuri village of Bagicha Tehsil, Jashpur district of Chhattisgarh, India The Upper Reservoir falls in 23°3'16.01"N and 83°37'3.92"E and Lower Reservoir falls in 23°1'1.78"N and 83°38'11.86"E respectively.
Inter- state issue involved	No
Seismic zone	Zone-II

- **Category Details:**

Category of the project	A
Provisions	-
Capacity / Cultural command area (CCA)	2100 MW
Attracts the General Conditions (Yes/No)	No
Additional information (if any)	-

- **Electricity generation capacity:**

Powerhouse Installed Capacity	6 units of 350 MW each
Generation of Electricity Annually	4366.5 GWh
No. of Units	6
Additional information (if any)	-

- **ToR/EC Details:**

Cost of project	Rs. 7643.87 Crores
Total area of Project	327.68 Hectares (Say 328 Ha)
(Height of Dam from deepest Foundation level (EL))	Upper dam- 22m
Length of Tunnel/Channel	3159 m
Details of Submergence area	216.54 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	E flows will be governed from the proposed Lower dam planned on Dorki Nalla

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

- **Muck Management Details:**

No. of proposed disposal area/ (type of land- Forest/ Pvt. land)	25 hectares (approx.) non-forest land
Muck Management Plan	Will be prepared during DPR
Monitoring mechanism for Muck Disposal	Will be prepared during DPR

- **Land Area Breakup:**

Private land/Non Forest land	253.54 Hectares (Non Forest Land)
Government land/Forest Land	74.14 Hectares (Forest Land)
Submergence area/Reservoir area	216.54 Hectares
Land required for project components	327.68 Hectares (Say 328 Ha)
Additional information (if any)	-

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

Forest Land/ Protected Area/ Environmental Sensitivity Zone	Yes/No	Details of Certificate/letter/Remarks
Reserve Forest/Protected Forest Land	(Yes)	**Total Forest Land – 74.14 Ha** *(Protected Forest Land – **53.43** Ha* *Reserved Forest Land – **20.71** Ha)*
National Park	No	
Wildlife Sanctuary	No	

- **Court Case Details: Nil**

- **Miscellaneous:**

Particulars	Details
Details of consultant	WAPCOS Limited

Project Benefits	Hydro-electric power and Employment generation
Status of other statutory clearances	-
R&R details	Yes (Total 125 - 140 Households) Upper Reservoir: 50-55 Households Lower Reservoir: 45-50 Households Water Conductor System & Power House: 30-35 Households

12.3.3 The Proposal was earlier considered by the EAC in its 7th meeting held on 09.02.2024 wherein the EAC deferred the proposal seeking additional information, accordingly PP vide its reply dated 14.06.2024 on Parivesh submitted the following:

Query 1: The project proponent shall explore any alternate source of water nearer to the site as Dorki Nallah is not a perennial river or alternative site specifically for lower reservoir. Also submit the Seasonal hydrograph of Dorki Nallah to assess the make-up water during lean season.

Reply:

A site visit has been carried out from 27th -30th April 2024 to examine/study the project area. It is confirmed that Dorki Nallah, a tributary of the Ib River, is the water source in the project area. The river map of the Jashpur district has been submitted.

As no other water source except the Dorki Nala is available in the vicinity of the project area, hence the Lower reservoir is proposed on the Dorki Nala itself. The Two (02) alternative sites for the Lower reservoir have been identified in the Dorki Nallah reach and named as Alternative- 5 & 6. Overall 06 no alternatives have been studied and has been submitted.

Seasonal Hydrograph of Dorki Nallah

No observed Gauge and discharge data in and around the project or in the d/s of the proposed Lower dam is available for the Dorki nalla.

The nearest G&D site is Thettanagar on Ib River after the confluence of the Maini River with the Ib River, which is approximately 70 km d/s of proposed lower dam site.

In the absence of any observed data at Dorki nalla, an attempt was made to prepare an average monthly discharge curve based on the IMD gridded rainfall data for the project catchment using the runoff factor method.

As per the Hydrological studies:

The Average flows in monsoon season (Jun-Oct.)

Maximum = 64 cumec in June (7.1 MCM)
Minimum = 11.7 cumec in Oct.(1.3 MCM)

The Average flows in the Lean season (Nov-May)
Maximum = 4.5 cumec in May(0.5 MCM)
Minimum = 1.1 cumec in Dec. (0.1 MCM)

The catchment area of the Proposed Rouni PSP at the proposed Lower Dam site is 47.22 sq.km and the average monsoon yield has been estimated as 25 MCM.

The one-time filling requirements of the Upper & Lower Reservoirs of the proposed Rouni PSP scheme is 19.87 MCM only. The filling of reservoirs will be considered only in the monsoon season.

Provision of Environmental flow release shall be kept as per the prevailing Guidelines of E-flow, i.e 30% for Monsoon Months to cater downstream water requirement.

Query 2: PP shall resubmit the proposal with revised layout after minimizing the forest land for the proposed project.

Reply:

- The possible Six (06) nos of alternatives for both the dam sites have been studied keeping in account the minimal utilization of Forest Land, and based on that the project Layout has been proposed/selected to go-ahead with.

- The total land requirement for the proposed layout is 327.68 Ha (Including Surface & Underground). The forest boundary has also been superimposed on the Project Layout and has been submitted.

- It is clearly marked that 74.14 Ha land is forest land, rest is Private/ Government Land. Out of 74.14 Ha of forest land, 44.5 Ha land comes under submergence of both reservoir which will get affected. The balance 29.64 Ha of forest land is falling in Underground structures (HRT, TRT, MAT & CAT). This is notional.

- The Forest land is 22.8% of the total Land requirement for the Proposed Rouni PSP Scheme.

Query 3: Finalize the site of Muck disposal outside the forest area and explore the possibility for management of muck in any closed nearby coal mine (if any).

Reply: There is no Coal mine facility either closed or operating is available in the vicinity of the project area, however, the muck disposal sites have been identified and the same has been proposed outside the forest area and has been submitted.

Query 4: PP shall submit MoU signed with State department for setting up the proposed project and availability of water for the project.

Reply: The Energy Dept. of Govt. of Chhattisgarh has issued the order to PP for preparation of DPR & also PP is a Nodal Agency for Identification, survey, investigation & development of PSP within the state. Document has been submitted.

Query 5: Secondary data of presence/occurrence of wildlife in the in consultation in forest department and local people shall be provided.

Reply: A site visit of the project area was carried out in the last week of April, 2024. The secondary data for the project area has been collected and has been submitted.

It is pertinent to mention that there is no Wildlife Sanctuaries, Biosphere Reserve, National Parks, Wild Life Corridors etc…. in the proposed project sites.

12.3.4 The EAC during deliberations noted the following:

The EAC deliberated on the information submitted (Form 1, PFR, kml file, etc**.)** and as presented in the meeting and observed that the proposal is for grant of terms of reference to the project for Rouni Open Loop Pumped Storage Project (2100 MW) in an area of 370 ha at Village Bhadikona, Chhichhli and Rajpuri R F, Sub-district Bagicha, District Jashpur, Chhattisgarh by M/s Chhattisgarh State Power Generation Company 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.

12.3.4 The EAC based on the information submitted and as presented during the meeting, **recommended** the proposal for grant of Standard ToR for conducting EIA study with Public consultation to the project for Rouni Open Loop Pumped Storage Project (2100 MW) in an area of 370 ha at Village Bhadikona, Chhichhli and Rajpuri R F, Sub-district Bagicha, District Jashpur, 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. Explore the possibilities for reducing the Forest land requirement. The application for obtaining Stage I FC for 74.14 Ha of forest land involved in the project shall be submitted.
ii. 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.

iii. PP shall submit the detail plan for filling the reservoir in 2 years for generating envisaged capacity with excess monsoon water only.

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

v. 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.

vi. 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.

vii. 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.

viii. 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.

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

x. Impact of project on downstream users utilizing water of Dorki nallah shall be incorporated in EIA/EMP along with mitigation measures.

xi. Action plan for survival and diversion of the Dorki Nalla shall be submitted.

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

xiii. 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.

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

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

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

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

[B] Socio-economic Study

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

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

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xxi. Land acquired for the project shall be suitably compensated in accordance with the law of the land with the prevailing guidelines. Private land shall be acquired as per provisions of Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013.

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[C] Muck Management/ Disaster Management

xxiii. 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.

xxiv. 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.

xxv. 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.

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

[D] Disaster Management

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[E]Miscellaneous

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CWC/CEA shall be submitted.

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xxxiv. Detailed plan to restore wider roads and convert them into narrow upto 10m after construction of the project. vii Specific Terms of Reference (ToRs) issued by the Ministry vide Office Memorandum No. F. No. IA3-22/33/2022-IA.III dated 14.08.2023 for Pumped storage projects shall be used for preparation of EIA/ EMP reports.

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

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

Agenda Item No. 12.4:

Panaura Pumped Storage Project (1500 MW), in an area of 236.5 ha. located at Village Soman, Argarh. Chichli etc Tehsil Robertsganj, District Sonbhadra, Uttar Pradesh by M/s Adani Green Energy Limited – Terms of References (TOR) - reg.

[Proposal No. IA/UP/RIV/472012/2024; F. No. J-12011/14/2024-IA-I(R)]

12.4.1: The proposal is for grant of Terms of References (ToR) to the project for Panaura Pumped Storage Project (1500 MW), in an area of 236.5 ha. located at Village Soman, Argarh. Chichli etc Tehsil Robertsganj, District Sonbhadra, Uttar Pradesh by M/s Adani Green Energy Limited.

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

i. The Panaura Pumped Storage Hydro Project (1500 MW) in an area of 236.50 ha located at Village Soma, Argur, Chananee etc., Tehsil Robertsganj, District Sonbhadra, Uttar Pradesh by M/s Adani Green Energy Limited.

ii. It is a standalone scheme with two new Greenfield reservoirs and utilizes storage between the two proposed reservoirs for energy generation. The scheme is envisaged to meet the peak demand of about 6.0 hours with an estimated annual energy generation of 3121 MU. Off-peak pumping hours are estimated as 6.95 hours with annual pumping energy of 3946 MU. The cycle efficiency of the project is 79%.

iii. The proposed Panaura PSP is planned an 'Off stream closed loop' scheme. Major source of water for this pumped storage scheme will be the Sone River. A one-time allocation /requirement of 13.22MCM are required for the cyclic operation of generation cum pumping of the PSP.

iv. The geographical co-ordinates of the proposed upper reservoir are at Latitude 24°32'50.58"N and Longitude is 83°24'24.84"E. The catchment area up to upper dam site is estimated to be about 1.0 km2. The geographical co-ordinates of the proposed upper reservoir are at Latitude at 24°31'30.04"N and Longitude is 83°24'40.03"E. The catchment area up to the existing lower dam is about 7.0 km2.

v. The Panaura Pumped Storage Project envisages construction of two artificial reservoirs near Panaura, Shoma, Argur, Chananee & Chichlik Villages in Sonbhadra district, Uttar Pradesh.

vi. **Land requirement:** The total land requirement for the proposed project is about 236.5ha; out of which about 230.25ha is forest land and remaining about 6.25 Ha is non-forest area.

vii. **Water requirement:** Panaura PSP (1500 MW) will require 13.22 MCM for initial reservoir filling and thereafter ~ 1.52 MCM per year will be required on annual basis from Sone River for restoring the storage capacity lost due to evaporation.

viii. **Project Cost:** The estimated project cost is Rs 7463.64 crore. Total capital cost earmarked towards environmental pollution control measures will be worked out during EIA study as well as the Recurring cost (operation and maintenance).

ix. **Project Benefit:** Total Employment will be 1200 people direct & 200 persons indirect.

x. **Environmental Sensitive area**: Kaimur WLS (Bihar) is located about 6.90km, however, proposed project is outside the notified ESZ boundary of the sanctuary. River/water body, Sone River is flowing at the aerial distance of 0.5km in west to east direction.

xi. MoU signed with State Government on 16.05.2024 MoU no. 24/REN/0000028126.

xii. Alternative Studies: 4 alternative layouts have been prepared and compared for development of PSP. Alternative study is as under:

Reservoir ID	Reservoir Name	FRL (RL in m)	MDDL (RL in m)	Gross Storage (MCM)	Dam Length (m)	Dam Height (m)	Remarks
1	R-1	550	533	8.10	1550	24	Higher storage capacity, minimal/no

							Habitations, lesser dam height
2	R-2	225	184	8.46	1000	48	Higher storage capacity, minimal/no Habitations
3	R-3	570	546	5.54	750	33	Lesser Gross storage, Reservoir area may overlap with other PSP developer
4	R-4	198	184	7.79	500	21	Reservoir area overlapping with other PSP developer
5	R-5	544	530	8.79	950	19	Reservoir area overlapping with other PSP developer, Habitations in submergence area

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

1	**EAC MEETING DETAILS**		
i	EAC meeting/s	:	12TH EAC Meeting
ii	Date of Meeting/s	:	18th July 2024
iii	Date of earlier EAC meetings	:	Not Applicable
2	**PROJECT DETAILS**		
i	Name of the Proposal	:	Panaura Pumped Storage Project (1500MW)
ii	Location (including coordinates)	:	**Located at Village Soma, Argur, Chananee etc., Tehsil Robertsganj, District Sonbhadra, Uttar Pradesh** The proposed project involves creation of upper reservoir are at longitude 83°24'24.84"E and latitude is 24°32'50.58"N and that of lower reservoir are at longitude 83°24'40.03"E and

			latitude 24°31'30.04"N Water will be sourced from Sone River in Sonbhadra district.
iii	Interstate Issue	:	No
iv	Seismic Zone	:	Zone-III
3	**CATEGORY DETAILS**		
i	Category of the project	:	A
ii	Provisions	:	-
iii	Capacity	:	1500MW
iv	Attracts the General Conditions (Yes/No)	:	Yes
v	Additional Information if any	:	No
4	**ELECTRICITY GENERATION AND CAPACITY**		
i	Powerhouse Installed Capacity	:	1500 MW
ii	Generation of Electricity Annually	:	3121 MU
iii	No. of Units	:	6 nos. (4 X 300 MW + 2 X 150 MW)
iv	Additional information (if any)	:	Nil
5	**TOR/EC DETAILS**		
i	Cost of project	:	INR 7463.64crore
ii	Total area of Project	:	236.5 ha
iii	Height of Dam from Riverbed (EL)		Lower Dam – 47m, Upper Dam – 27m
iv	Length of Tunnel/Channel		3181m
v	Details of Submergence area		190ha

vi	Types of Waste and quantity of generation during construction/ Operation		Muck from excavation, solid waste from labour colony and construction waste.
vii	E-Flows for the Project		Not Applicable, as this is Off-Stream closed Loop Pumped Storage Project (PSP)
viii	Is Projects earlier studies in Cumulative Impact assessment & Carrying Capacity studies (CIA&CC) for River in which project located. If yes, the		No
a	E-flow with TOR /Recommendation by EAC as per CIA&CC study of River Basin.		ot Applicable
b	If not the E-Flows maintain criteria for sustaining river ecosystem.		ot Applicable
6	**MUCK MANAGEMENT DETAILS**		
I	No. of proposed disposal area/ (type of land- Forest/Pvt. land)	:	15.0ha Private Land
Ii	Muck Management Plan	:	Will be Provided in EIA/EMP report
Iii	Monitoring mechanism for Muck Disposal	:	Will be Provided in EIA/EMP report
7	**LAND AREA BREAK-UP**		
I	Private Land	:	6.25ha
Ii	Government land/Forest	:	230.25ha

	Land		
Iii	Submergence area/Reservoir area	:	190.0ha
Iv	Land required for project components	:	46.50ha
V	Additional information (if any)	:	Nil

8	**PRESENCE OF ENVIRONMENTALLY SENSITIVE AREAS IN THE STUDY AREA**		
S.no	**Forest Land/ Protected Area/ Environmental Sensitivity Zone**	**Yes/ NO**	**Details of Certificate/letter/Remarks**
I	Reserve Forest/PF Land	NO	Distance from nearest protected area (Kaimur WLS; Bihar) is 6.90 Km, however, proposed project is outside the notified ESZ boundary of the sanctuary.
ii	National Park	NO	
iii	Wildlife Sanctuary	NO	

9	**COURT CASE DETAILS**		
i	Court Case	:	Nil
ii	Additional Information if any	:	Nil

10	**AFFIDAVIT/UNDERTAKING DETAILS**		
i	Affidavit/Undertaking	:	Enclosed
ii	Additional information (if any)	:	Nil

11	**PREVIOUS EC COMPLIANCE AND NECESSARY APPROVALS**		
i	Certified EC compliance report (if applicable)	:	Not Applicable
ii	Status of Stage- I FC	:	Yet to Apply
iii	Additional detail (If any)	:	Nil
iv	Is FRA (2006) done for FC-I		Not Applicable

12 MISCELLANEOUS			
i.	**Details of Consultant**		
	Name of Consultant	:	M/s. RS Envirolink Technologies Pvt. Ltd. (RSET) (NABET Accredited Consultant Organization)
	Certificate No	:	NABET/EIA/2225/RA0274
	Validity	:	August 15, 2025
	Contact Person	:	Mr. Ravinder Bhatia
	Name of Sector	:	River Valley and Hydroelectric Projects
	Category	:	A
	MoEF&CC Schedule	:	1(c)
ii	**Project Benefits**	**:**	Pumped storage hydropower is a modified use of conventional hydropower technology to store and manage energy or electricity by moving water between an upper and lower reservoir. Currently, pumped storage round-trip or cycle energy efficiencies exceed 80%, comparing favorably to other energy storage technologies and thermal technologies. This effectively shifts, stores, and reuses energy generated until there is corresponding demand for system reserves and variable energy integration. This shifting can also occur to avoid transmission congestion periods, to help more efficiently manage transmission grid, and to avoid potential interruptions to energy supply. This is important because many of the renewable energy resources being developed (e.g., wind and solar) are generated at times of low demand and off-peak energy demand periods are still being met with fossil fuel resources, often at

			inefficient performance levels that increase the release of greenhouse gas emissions. Further, pumped storage projects are critical to the national economy and overall energy reliability because it's: o Least expensive source of electricity, not requiring fossil fuel for generation o An emission-free renewable source o Balancing grid for demand driven variations o Balancing generation driven variations o Voltage support and grid stability Apart from this, proposed PSP will also benefit the local community by creating employment opportunities and will result in upliftment of livelihood and socio-economic conditions.

12.4.3 The EAC during deliberations noted the following

The EAC deliberated on the information submitted (Form 1, PFR, kml file, etc.) and as presented in the meeting and observed that the proposal is for grant of terms of reference to the project for Panaura Pumped Storage Project (1500 MW), in an area of 236.5 ha. located at Village Soman, Argarh. Chichli etc Tehsil Robertsganj, District Sonbhadra, Uttar Pradesh by M/s Adani Green Energy 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 total land requirement for the proposed project is about 236.5ha; out of which about 230.25ha is forest land and remaining about 6.25 Ha is non-forest area. The application for Stage-I forest clearance is yet to be obtained. The EAC noted that more than Five PSP projects are proposed to be installed in close vicinity and source of water for all projects is Son River. In view of cascade development of PSP projects in the region the EAC was concerned about its impact on topography and water availability for sustaining the river eco-system, as the SON River is not a snow feed river it receives water from its catchment during monsoon season only, if the water channels/ rivulets available in the catchment gets disturbed due to excessive development of such projects, the sustainability of the river may be adversely affected. Flow health assessment and cumulative

impact assessment & carrying capacity study of Son River is the utmost requirement before taking up Pumped Storage Projects in the river basin.

12.4.4 The EAC based on the information submitted and as presented during the meeting, **recommended** the proposal for grant of Specific ToR applicable for the project for conducting EIA study with Public Consultation to the project for Panaura Pumped Storage Project (1500 MW), in an area of 236.5 ha. located at Village Soman, Argarh. Chichli etc Tehsil Robertsganj, District Sonbhadra, Uttar Pradesh by M/s Adani Green Energy Limited, under the provisions of EIA Notification, 2006, as amended along with the following additional/specific ToR.

[A] Environmental Management and Biodiversity Conservation:

i. Forest Division of the Ministry and State Government while appraising Forest Clearance, shall take into account the richness of biodiversity and pristine forest area to take appropriate decision.
ii. Explore the possibilities for reducing the Forest land requirement. The application for obtaining Stage I FC for 230.25 ha of forest land involved in the project shall be submitted.
iii. Certificate and certified map from Chief Wildlife Warden shall be submitted mentioning that project boundary is not falling in any Ecological Sensitive Area, Wildlife Sanctuary/Tiger/elephant corridor/Critically polluted area within 10 km of Project site.
iv. PP shall submit the detail plan for filling the reservoir in 2 years for generating envisaged capacity with excess monsoon water only.
v. No Objection Certificate from State of Jharkhand and Bihar as there may be genuine concern of downstream consumers to avoid scarcity of water to consumers. The availability of water in the river shall be submitted by Project Proponent from Central Water Commission and State Water Resources Department.
vi. No transportation of raw materials shall be done through/within the Wildlife Sanctuary prior to the grant of State Government/ Forest Department/Wildlife Department. Accordingly, transportation plan shall be submitted by PP.
vii. Environmental Cost Benefit Analysis shall be done in terms of loss of Forest ecosystem due to diversion of Forest land/loss of biodiversity, water availability, water uses for generation of hydro power and Ecological flows.
viii. Calculation and values of GHGs (CO_2, CH_4 etc.) emissions during construction and during operation till the life of the project shall be estimated and submitted.
ix. The longitudinal connectivity/Free flowing sketch be provided in the EIA/EMP report. Presence of any critical mineral zone in the proposed area be clarified from GSI.
x. Quantitative values of Impact modelling of environmental parameters shall be submitted for during construction and operation. Also, mitigation measures shall be submitted in terms of construction and operation phase.
xi. Conducting site specific ecological study with respect to riverine ecology focus on fishes diversity, fish migration, habitat and aquatic biota due to construction PSP. Impact assessment on the fish diversity based on the hydrological alteration at the water drawing sources Sone River shall be studied.
xii. Cumulative Impact of project on carrying capacity and sustainability of Reservoir/ Sone River /nala of catchment area / due to tapping of water for filling reservoir.
xiii. Action plan for survival or diversion of the rivulets/stream leading to join Sone river shall

be submitted.

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

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

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

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

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

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

[B] Socio-economic Study

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

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

xxii. 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.

xxiii. Land acquired for the project shall be suitably compensated in accordance with the law of the land with the prevailing guidelines. Private land shall be acquired as per provisions of Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013.

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

[C] Muck Management/ Disaster Management

xxv. 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.

xxvi. 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.

xxvii. 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.

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

[D] Disaster Management

xxix. 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.

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

[E]Miscellaneous

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

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

xxxiii. 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.

xxxiv. Drone video of project site shall be recorded and to be submit.

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

xxxvi. Detailed plan to restore wider roads and convert them into narrow upto 10m after construction of the project. vii Specific Terms of Reference (ToRs) issued by the Ministry vide Office Memorandum No. F. No. IA3-22/33/2022-IA.III dated 14.08.2023 for Pumped storage projects shall be used for preparation of EIA/ EMP reports.

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

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

Agenda Item No. 12.5:

Kutehr Hydro-electric Project (240 MW) in an area of 69.3783 ha. located at Village Machhettar, Sub District Bharmour, Holi, Chamba District Chamba, Himachal Pradesh by M/s Jsw Energy (Kutehr) Limited –Extension Validity of Environmental Clearance (EC) - reg.

[Proposal No. IA/HP/RIV/480995/2024; F. No. J-12011/67/2007-IA-I]

12.5.1 The proposal is for grant of Extension Validity of Environmental Clearance (EC) to the project for Kutehr Hydro-electric Project (240 MW) in an area of 69.3783 ha. located at Village Machhettar, Sub District Bharmour, Holi, Chamba District Chamba, Himachal Pradesh by M/s Jsw Energy (Kutehr) Limited.

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

i. The Kutehr Hydroectric Project (240 MW) is being developed on Ravi river in Chamba district of Himachal Pradesh. The project is envisaged as run-of- the-river scheme in the upper reaches of Ravi basin.

ii. The Environment Clearance was granted to Kutehr 240 MW Hydroelectric Project on 05th Jul, 2011. It was subsequently, amended on 18th Jun 2021 (Extension in validity of EC) & 16th Nov. 2021 (Transfer of EC from Mis JSW Energy Limited to Mis JSW Energy (Kutehr) Limited). The EC is valid upto 4th July 2024.

iii. Implementation Agreement was signed with GoHP in the year 2011. Concession period is 40 years from COD. Zero Date for start of Construction works of project has been redefined as 29.10.2019 by GoHP vide Second Supplementary IA dated 27.01.2021. Anticipated investment in the project to the tune of Rs. 2879 Crores. As of April 2024, about 80% of the project work has been completed. According to our commitment with the State Government of Himachal Pradesh, the remaining work is projected to be completed by October 2024.

iv. The overall progress of the project was mainly delayed due to the following main reasons:

   a) **Natural Calamities (Rain & Snow fall):** Regular landslides and blockade on NH 154 A and project road are experienced since beginning of the project due to heavy rainfall and snowfall. Due to this the project timelines are significantly affected as the vehicle movement and supply chain management is totally hampered.
   b) **High flood**: Every monsoon season barrage works was delayed for at least 3 months/year due to flash floods and heavy rainfall. In the year 2022 barrage works was stooped due to flash floods (3 times) and in the year 2023 the ongoing works of the barrage was stopped for 3 months i.e., July August & September due to the high flood occurred on 8th of July 2023.

c) **COVID-19 Pandemic:** Due to lockdown imposed by Government of India and Government of Himachal Pradesh because of COVID -19 pandemic, all works were stopped from 23.03.2020. Some activities with the available resources at site was started w.e.f. 15.06.2020/

d) **Cloud bursts**: 2 No's Cloud bursts at Sanah Nala in the month of July -2023 at Adit-3 which washed away the construction equipment of contractor and damaged the approach road to the adit-3. Due to this, the HRT works were delayed by almost 2 months at Adit-3

e) **Bridges:** The whole supply chain and vehicle movement was disturbed due to the damages of the bridges. In the year 2022- 23, a bridge near Kharamukh was damaged and in the year 2023-24 two bridges i.e., one at Choli and other at Luna was collapsed which delays the project works by almost 1 months.

f) **Landslide at Kharamukh** – Holi Road: Due to heavy rains from 14.04.2024 to 16.04.2024 huge landslide occurred at Kharamukh to Holi Road (1.8 km from Kharamukh) and approach road to Adit-6 & Bottom of Surge Shaft un the early hours of 17.04.2024. Due to this landslide about 150 meters of Kharamukh Holi road and about 200 meters of approach road to Adit-6 has been damaged badly. The restoration of damaged roads is still going on

12.5.3 The EAC during deliberations noted the following:

The EAC deliberated on the information submitted and as presented in the meeting and observed that the proposal is for grant of Extension of Validity of Environmental Clearance (EC) dated 05.07.2011 to the project for Kutehr Hydro-electric Project (240 MW) in an area of 69.3783 ha. located at Village Machhettar, Sub District Bharmour, Holi, Chamba District Chamba, Himachal Pradesh by M/s Jsw Energy (Kutehr) 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 committee noted that EC to the said project was granted on 05.07.2011 and subsequently, EC was further extended vide letter dated 16.11.2021. Additionally, the EAC noted that Stage -II FC was granted by MoEF&CC on 11.01.2013, therefore as per OM no. IA3-22/10/2022-IA.III[E-177258] dated 11.04.2022 validity of EC shall be counted from 11.01.2013. The EAC noted that EC is valid till 10.01.2027 as per provisions of the EIA Notification, 2006, as amended.

Therefore, the proposal was ***returned in present*** form.

<u>Agenda Item No. 12.6:</u>

Subansiri Upper HE Project (1605 MW) in an area of 2972 ha. located at Village Pairijo, Tehsil Gussar, District Upper Subansiri, Arunachal Pradesh by M/s NHPC Limited – Terms of References (TOR) - reg.

[Proposal No. IA/AR/RIV/466971/2024; F. No. J-12011/59/2010-IA-I (R)]

12.6.1: The proposal is for grant of Terms of References (ToR) to Subansiri Upper HE Project (1605 MW) in an area of 2972 ha. located at Village Pairijo, Tehsil Gussar, District Upper Subansiri, Arunachal Pradesh by M/s NHPC Limited.

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

i. The proposal is for ToR to the project for Subansiri Upper HE Project located at about 1.5 km u/s of Menga village and about 25 km from Daporijo in Upper Subansiri District, Arunachal Pradesh by M/s NHPC Ltd.

ii. The geographical co-ordinate of the project are Lat. 28°06'34.05"N, Long. 94°09'20.45"E.

iii. **The Project envisages construction of:** The Subansiri Upper HE Project envisages construction of 1605 MW hydroelectric project with the twin objectives of power generation and flood moderation**.**

iv. **Demographic details in 10 km radius of project area:** About 27 nos. of villages comprising 982 families are likely to be affected due to the proposed Project. The socio-economic study aims to assess the overall impacts on various facets of socio- economic environment due to establishment of the project. The information on various aspects of the affected population viz., demographic details, socio-economic and cultural characteristics, enumeration of personal properties of the affected population, education level and occupational profile etc. shall be collected besides ethnographic assessment of PAFs during the EIA & SIA study.

v. **Project Cost**: The estimated project cost is Rs. 21815.00 Crore. Total capital cost earmarked towards environmental pollution control measures is approx. **2% to 3%** of the estimated project cost. Detail allocation along with Recurring cost (operation and maintenance) shall be done after preparation of EIA/EMP study.

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

vii. **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.

viii. **MoU/ any other clearance/ permission signed with State government:** Memorandum of Agreement signed on 12.08.2023 between Govt. of Ar. P and NHPC Ltd for development, commissioning, implementation, operation and maintenance of Subansiri

Upper HEP on BOOT basis for a lease period of 40 years from the commercial operation date.

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

x. **Environmental Flow:** For sustainable hydropower development of Subansiri river basin, IA-1 Division of MoEF&CC vide their letter No. 2/18 (A)/ 2014-EIA dated 27.04.2016 has approved study report on Cumulative Impact Assessment & Carrying Capacity Study (CIA&CCS) of Subansiri river basin in Arunachal Pradesh for development of Hydroelectric Power Projects. The study outlines the recommended capacity, size and location of HEP's commensurate with basin environment carrying capacity conforming to the accepted cumulative impacts. As per recommendations, following environment flows are approved:

Seasons	Environment Flows (% age)
Monsoon Season (June- September)	20
Non-Monsoon Non-lean (March-May and October)	20
Lean Season (November-February)	20

xi. **Alternative Studies:** Developing and assessing various alternative schemes is one of the first activities during the preparation of the DPR. Various alternative studies have been carried out for arriving at the most optimal location & layout of the Project. While carrying out the detailed studies, different axes have been identified by various agencies, as under:

River Subansiri originates from Tibet and after traversing 375 km joins the Brahmputra river. It is one of the largest right bank tributaries of Brahmaputra. The total catchment area of Subansiri River up to the proposed dam site at Menga is 14665 Sq. Km. Brahmaputra Board had prepared Detailed Project Report (DPR) after conducting detailed survey and investigation of 257 m high Subansiri Dam Project (4800 MW) in April 1983 at Gerukamukh where the river debouches into the Assam plain. The proposal could not get through due to reservations from Government of Arunachal Pradesh on account of large submergence of land and townships like Daporijo, Dumporijo, Tamen etc. and consequent displacement of inhabitants.

Subsequent to shelving of high dam near Gerukamukh on Subansiri river by Brahmaputra Board it was proposed to build high dams in the upper reaches. Accordingly, on Subansiri river four alternate sites were examined near Daporijo (Headquarter of Upper Subansiri district) along river Subansiri, (refer Plate 4) viz.

1. Site A, 3.5 km upstream of Daporijo.
2. Site B, 31 km upstream of Daporijo.
3. Site C, a little upstream of Menga confluence.
4. Site D, a little upstream of Sippi Village.

Out of these four possible sites, Brahamputra Board in consultation with CWC and GSI, considered site-C located at about 1.5 km up stream of confluence between river Menga and river Subansiri as better option. This site was preferred over other sites by the team due to occurrence of massive and strong dolomitic rocks striking almost across the river and having subvertical firm dam abutment in a narrow valley and it was decided to investigate the same.

Subsequent to taking over the Project by NHPC detailed field traverses were also undertaken to locate any other alternative suitable sites in upstream as well as downstream along the river course. But as evaluated by the technical team during Brahmaputra Board period investigation, the site upstream of Menga village is found to be relatively better site to host Project components because of strong to very strong dolomitic limestone. Accordingly, this was considered for detailed investigation. For better abutment condition the dam axis was reviewed and relocated at 75m d/s from Brahmaputra Board site "C".

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

Sewage and solid waste shall be generated from project colonies during construction as well as operational phase.

Solid waste generated from temporary and permanent colonies during construction as well as operation phase shall be disposed off as per the Solid Wastes Management Rules (SWM), 2016.

Shall be handled as per Hazardous Waste Management Rules,

2016. Muck disposal plan shall be finalized after EIA/EMP study.

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

- **Project details:**

Name of the Proposal	TOR Approval for Subansiri Upper HE Project

Location (Including coordinates)	About 1.5 km u/s of Menga village and about 25 km from Daporijo in Distt. Upper Subansiri, Arunachal Pradesh. Lat. 28°06'34.05"N, Long. 94°09'20.45"E
Inter- state issue involved	No
Seismic zone	Zone-V

- **Category details:**

Category of the project	1(c) River Valley/Irrigation projects Sector : RIV
Provisions	A Hydro Electric Project with the twin objectives of power generation and flood moderation.
Capacity / Cultural command area (CCA)	1605 MW
Attracts the General Conditions (Yes/No)	No
Additional information (if any)	Nil

- **Electricity generation capacity:**

Powerhouse Installed Capacity	1605 MW
Generation of Electricity Annually	6131.55 MU
No. of Units	8 Units (Main Unit- 7 x 215 & Auxiliary Unit 1 x 100) = 1605 MW
Additional information (if any)	Nil

- **ToR/EC Details:**

Cost of project	Rs. 21,815 Crore
Total area of Project	2972 Ha
Height of Dam from River Bed (EL)±253	219m
Length of Tunnel/Channel	12.5 Km including all water conveying tunnels and construction/Access Tunnel
Details of Submergence area	2220 Ha
Types of Waste and quantity of generation during construction/ Operation	Hydroelectric projects do not generate any bye-product during electricity generation. Hydroelectric power is generated by non-consumptive use of water. However, during construction phase of the project, about 11,500 KLD per day of waste water; 60 lakh cum of muck & Solid Waste shall be generated. A detailed management plan shall be prepared during EIA study in line of Standard TOR.
E-Flows for the Project	Environment flow has been considered based on Cumulative Impact and Carrying Capacity Studies (CI &CC) of Subansiri Basin including

	downstream impacts wherein minimum environmental flow has been considered as 20% of the average flow in monsoon, Pre & Post monsoon and lean period of 90% dependable year.
Is Projects earlier studies in Cumulative Impact assessment & Carrying Capacity studies (CIA&CC) for River in which project located. If yes, then a) E-flow with TOR /Recommendation by EAC as per CIA&CC study of River Basin. b) If not the E-Flows maintain criteria for sustaining river ecosystem.	Yes. As mentioned above

- **Muck Management Details:**

No. of proposed disposal area/(type of land-Forest/Pvt. land)	35 ha area is proposed for muck disposal and the land status is USF/community land.
Muck Management Plan	Shall be prepared in EMP based on EIA studies.
Monitoring mechanism for Muck Disposal	Shall be prepared in EMP based on EIA studies

- **Land Area Breakup:**

Private land / Non Forest Land	Nil
Government land or Forest Land/USF	2972 Ha
Submergence area/Reservoir area	2220 ha at FRL 460 M
Land required for project components	200 Ha
Additional information (if any)	

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

Forest Land/ Protected Area/Environmental Sensitivity Zone	**Yes/No**	**Details of Certificate/Letter/Remarks**
Reserve Forest/Protected Forest Land	No	No Protected area falls within the 10 Km radius of project component including the reservoir
National Park	No	
Wildlife Sanctuary	No	

- **Court case details: NIL**

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

Particulars	Nil
Certified EC compliance report (if applicable)	NA
Status of Stage-I FC	An application for Forest Clearance for

	diversion of 2972 ha shall be filed on PARIVESH 2.0 during DPR Preparation.
Is FRA (2006) done for FC-I	Shall be carried out during process of Forest Clearance

- **Miscellaneous**

Particulars	**Details**
Details of consultant	Tender were floated for hiring of Consultant for EIA/EMP study based on Standard TOR after accord of ToR. Further, any additional recommendation of EAC shall be taken care of by the Consultant.
Project Benefits	Free Power @12% to home state; LADF @1%; Power injection to National Grid; Benefit Under R&R plan; Reduced dependence on Fossil Fuels; Clean Energy Generation; Economic Development; regulated Water Flow, manage Floods, benefiting both the local communities and the environment; Energy Independence; Rural Electrification; Sustainable Development, promoting economic growth, and enhancing energy security for both the state and the nation as a whole.
Status of other statutory clearance	In the process of applying to concerned Directorate / Department of GOI/ GoAP
R&R details (Tentative)	No. of Villages: 27 Nos. of PAFs: 982 R&R Plan: Shall be firmed up during SIA study.

12.6.3 The EAC during deliberations noted the following:

- The EAC deliberated on the information submitted (Form 1, PFR, kml file, etc.) and as presented in the meeting and observed that the proposal is for grant of terms of references (ToR) to the project for Subansiri Upper HE Project (1605 MW) in an area of 2972 ha. located at Village Pairijo, Tehsil Gussar, District Upper Subansiri, Arunachal Pradesh by M/s NHPC Limited.

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

- The EAC observed that Subansiri Upper HE Project is proposed to be developed on Subansiri River in Arunachal Pradesh as a multipurpose project with twin objectives of power generation and flood moderation. Subansiri Upper HE Project was initially allotted to NHPC vide order dated 01.05.2000 and NHPC had submitted Feasibility Report of the project in June 2002. Approval to the Feasibility Report was accorded by CEA on 10.09.2002 and subsequently, NHPC carried out detailed study & field investigations for preparation of DPR. Later on GoArP decided to get the project implemented through Private Developers. The Project was allotted to M/s KSK Energy Ventures Ltd. by GoArP on BOOT basis for a lease period of 40 years from the Commercial Operation as per MOA dated 18.03.2010. M/s KSK submitted few DPR chapters but no Technical clearance was received. However, due to various reasons further progress for project development and submission of DPR not made by M/s KSK. Ministry of Power (MOP) vide letter dated 22.12.2021 allotted the Project to NHPC for its development. NOC for Subansiri Upper HEP was issued by Govt. of Arunachal Pradesh on 28.06.2023 and approved allotment of projects to NHPC on 21.07.2023. MOA was signed on 12.08.2023 between GOAP and NHPC Limited for development, commissioning, implementation, operation and maintenance of Subansiri Upper HEP on BOOT basis for a lease period of 40 years from the COD.

- Additionally, Memorandum of Agreement signed on 12.08.2023 between Govt. of Ar. P and NHPC Ltd for development, commissioning, implementation, operation and maintenance of Subansiri Upper HEP on BOOT basis for a lease period of 40 years from the commercial operation date.

- The EAC noted that CIA& CCS study has been completed for Subansari river basin, wherein the instant proposal has been included and recommended in said CIA&CCS.

- The EAC inquired about the proposed fish pass in the project, to which PP replied that there will be no fish pass proposed in the said HEP, therefore the committee opined that PP need to justify the reason for not proposing fish pass/fish ladder in the current proposal.

12.6.4 The EAC after detailed deliberation on the information submitted and as presented during the meeting **recommended** for grant of Standard ToR for conducting EIA study to the project with Public Consultation for Subansiri Upper HE Project (1605 MW) in an area of 2972 ha. located at Village Pairijo, Tehsil Gussar, District Upper Subansiri, Arunachal Pradesh by M/s NHPC Limited, under the provisions of EIA Notification, 2006, as amended along with the following additional/specific ToR. The PP shall be responsible for any objections on adverse impacts on the States downstream.

[A] Environmental Management and Biodiversity Conservation:

i. The project involves diversion of 2972 Ha of forestland. Forest clearance shall be obtained as per the prevailing norms of Forest (Conservation) Act, 1980. Application to obtain prior approval of Central Government under the Forest (Conservation) Act, 1980, for diversion of forestland required, should be submitted as soon as the actual extent of forestland required for the project is known, and in any case, within six months of issuance of this letter.

ii. 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.

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

iv. Environmental matrix during construction and operational phase needs to be submitted. Matrix formulated on the basis of detailed study and field survey of flora and Fauna methodology used shall be mentioned in the EIA report.

v. Details of Flora and Fauna reported in submergence area, Nos. of tree along with their density and nomenclature required to be cut for barrage creation and other project component.

vi. Three season (Pre-monsoon, Monsoon and winter season) baseline data of all the environmental attributes including biological environment as mentioned in the Standard ToR shall be collected for preparation of EIA/EMP report.

vii. Source of construction material and its distance from the project site along with detailed transportation plan for construction material.

viii. 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.

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

x. Explore the possibilities to reduce forest area for the construction of proposed project. Reduction of forest land with changing installed capacity.

xi. Conduct geological survey and find out availability of mineral in study area. Take Geological opinion from GSI regarding mineral zone in the project study area.

xii. Density of forest and its types including tentative nos of tree felled during construction of the project and details of plants species to be planted under compensatory plantation be mentioned in Compensatory Afforestation Plan under EIA/EMP.

xiii. Identify the sand mining/ quarrying sites in submergence area and downstream of reservoir. Source of construction material and its distance from the project site along with detailed transportation plan for construction material.

xiv. A detailed reclamation/ restoration plan of quarrying site/sites be incorporated in the EIA/EMP report.

xv. Certificate and certified map from Chief Wildlife Warden shall be submitted mentioning that project boundary is located outside the Eco Sensitive Zone (ESZ) and Wildlife Sanctuary.

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

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

xviii. Endemic plant and animal species found in the area concerned shall be provided instead listing entire endemic species found in the State.

xix. Details of Flora and Fauna reported in submergence area, Nos. of tree along with their density and nomenclature of the tree species required to be felled for reservoir creation and other project component.

xx. Project impact on avi-fauna shall be studied and incorporated in EIA/ EMP report.

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

[B] Socio-economic Study

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

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

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

xxv. Tentative no. of project affected families shall be identified and accordingly appropriate Rehabilitation & Resettlement plan shall be prepared. Details of settlement in 10 km area shall be submitted.

xxvi. Land acquired for the project shall be suitably compensated in accordance with the law of the land with the prevailing guidelines. Private land shall be acquired as per provisions of Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013.

[C] Muck Management/ Disaster Management

xxvii. 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.

xxviii. 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.

xxix. Details of water sprinkling arrangements for arresting the fugitive / dust, emission from transportation and other project activities in project construction area.

xxx. 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.

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

(D) Disaster Management

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

xxxiii. 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.

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

[E] Miscellaneous

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

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

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

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

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

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

Agenda item 12.7: Cumulative Impact Assessment and Carrying Capacity Study (CIA & CCS) of Yamuna River Basin in Uttarakhand by Indian Council of Forestry Research and Education (ICFRE), Dehradun – Additional Terms of Reference (TOR)

and

Agenda item 12.9: Cumulative Impact Assessment and Carrying Capacity Study (CIA & CCS) of Yamuna River Basin in Himachal Pradesh by Indian Council of Forestry Research and Education (ICFRE), Dehradun - Terms of References (TOR) -reg

The Indian Council of Forestry Research and Education (ICFRE), Dehradun along with its partner institutions made a presentation before the EAC (River Valley and Hydroelectric Projects) on the status of study report of Cumulative Impact Assessment and Carrying Capacity Study (CIA & CCS) of Yamuna River Basin in Uttarakhand state. The ICFRE, Dehradun informed in EAC meeting that:

i. ICFRE in association with study partner institutions (viz. DHRE, IITR; ICAR-DCFR, Bhimtal; WII-SACON, Coimbatore) conducted and submitted draft study report to UJVNL, GoUK on 18.11.2015 and the same was presented before SEIAA & SEAC on 28.07.2016.

ii. In addition, a study Report was presented before 22nd EAC meeting held on dated 27.02.2019 for River Valley & Hydroelectric Projects of MoEF&CC, GoI, New Delhi.

iii. The EAC in its 22nd meeting observed the following and suggested to compile the information before submission of draft final report:

   a. No river cross sections have been used for quantification of E-flow. E-flow study should be carried out by using data of river cross sections downstream (d/s) of projects or other suitable locations and after carrying out simulation analysis. Further, depth requirement for umbrella fish species should be taken for lean, non-monsoon, non lean & monsoon seasons separately. 25 cm is too less depth of water for E-flow estimation considering umbrella fish species viz., Trout and Mahaseer. The recommended Environmental Flow Rate (EFR) is required to be relooked based on the actual river cross sections, water depth requirement specific to the umbrella fish species and other downstream uses. In addition, the lower stretch of the Yamuna River is having high fish abundance, catch and the river being flat compared to middle and upper stretch of Yamuna River, would require different Environment Flow Requirement (EFR) for hydro-electric projects falling in these stretches. EFR recommendations should be based on analysis of actual data.

   b. Plankton/Benthic diversity should be grouped based on zonal, Periphyton group must be included in the site of trout zones. Depth & velocity requirement for ToR sp. must be revised seasonally**.** Report on Phyto-diversity (algae, Lichens, bryophytes Pteridophytes, gymnosperms & angiosperms) endemism, RET species, species from CITES list based on primary and secondary data needs to be provided. Criteria for estimation of riparian distance to be maintained between projects in cascade shall be relooked by considering all relevant parameters in addition to water quality.

   c. The recommendations should be specific in nature and linked with presented data and the impacts assessed. Recommendations regarding hydroelectric projects proposed to be considered/ dropped should be firmly supported with scientific data like extent of threat to habitat, migration routes, breeding sites, and other parameters etc. as per the provisions of

prevailing regulations in the country. The HEPs proposed to be considered/ dropped based on their proximity to Protected Areas and ESZ should also be relooked as per above criteria.

d. Proper linking be made between data, observations vis-à-vis recommendations. The Environmental Action Plan should be specific and aimed at mitigation of the adverse impacts due to hydro-electric projects.

e. EAC noted that the river basin study should not be limited to a particular State, it has to consider the complete basin or sub-basin. Thus, the hydroelectric projects located in the State of Himachal Pradesh in the Yamuna river basin should be included in the CIA & CC study. Hence, all the hydro-electric projects in Yamuna river basin up to Paonta Sahib in Sirmour district of Himachal Pradesh should be included in the study.

f. To that end, a proposal detailing revised scope of work, Terms of Reference, time frame, cost estimates, deliverables is required to be invited for completing the study in Yamuna river basin as above.

g. The total number of hydro-electric projects (operational, under construction and proposed) to be considered in the RBS shall be finalized and frozen in consultation with the both the state governments. No other HEPs shall be considered once the RBS has been finalized.

iv. Further, In 1st EAC (reconstituted) meeting held on dated 17-18 .10.2023, ICFRE, Dehradun presented the compliance status of 22nd EAC meeting (27.02.2019). It was observed by the EAC that adequate information w.r.t. some observations made by the EAC during its 22nd EAC meeting held on dated 27.02.2019 have not been provided by the ICFRE. The ICFRE during deliberations informed that River X (cross) section data from concerned State, has not been provided to ICFRE.

v. In the EAC (reconstituted) meeting held during 17-18th October, 2023, the EAC desired that a comprehensive report be submitted based on scientific, technological, biological, agro-forestry, ecological and socio-impact assessment and implications be submitted. The same report may pave way for other river basin studies and for future and planning of river basin management and sustainable development. The committee also suggested to expedite the collection of River X- section data from concerned authority and finalize the draft report on Cumulative Impact Assessment and Carrying Capacity Study (CIA & CCS) of Yamuna River Basin in Uttarakhand at earliest. EAC members also suggested for one season base line data to

be collected to finalize the draft report on Cumulative Impact Assessment and Carrying Capacity Study (CIA & CCS) of Yamuna River Basin in Uttarakhand.

vi. During the deliberations ICFRE informed that they have received River X- section data of the Uttarakhand region from the State Government.

vii. Further, ICFRE has submitted additional estimate of Rs. 120.62 Lakhs + GST and other taxes as applicable for collecting one season base line data as suggested by 1st EAC (reconstituted) meeting dated 17-18.10. 2023.

viii. In the present meeting (12th EAC-19.07.2024), **UJVNL** stated, that in response to the query on delay in submission of data it was informed that Pre-Feasibility Reports were prepared for the Techno- Economic Viable projects in the basin considering the various aspects such as altitude (below snow line), riparian distance between two cascade projects, proximity to protected areas/ National Part/ Wild life sanctuary /ESZ etc. The total number of HEPs proposed in the basin are now 38 instead of 46 HEPs proposed in the earlier draft report.

The EAC deliberated on the status report of Cumulative Impact Assessment and Carrying Capacity Study (CIA & CCS) of Yamuna River Basin in Uttarakhand presented by Indian Council of Forestry Research and Education (ICFRE), Dehradun. During deliberation, it was observed that for collection of one season data, ICFRE has submitted additional estimate of Rs. 120.62 Lakhs + GST and other taxes as applicable for collecting one season base line data as suggested by 1st EAC meeting dated 17-18.10. 2023. The EAC after detailed deliberations was of the view that after spending more than 10 years, the river profile could not be carried out for calculation of E-Flow. The principal consultant of the project and the committee expressed its disappointment that the deliverables promised by IIT Roorkee were not satisfactory, resulting in incomplete CIA&CC study of Yamuna River Basin in Uttarakhand. As the collection of one season base line data may further delay the study, the ICFRE, Dehradun, may compile all the observation of 22nd EAC meeting (27.02.2019) in terms of latest River X (cross) section data which is provided by UJVNL**.**

It was also suggested that, for conducting additional CIA&CC studies of Yamuna River basin in Himachal Pradesh as observed by 22nd EAC meeting dated 27.02.2019 may be decided after submission of the CIA&CC report on whatever have been accomplished. An external expert

committee may evaluate the report and after presentation by ICFRE and Team, may suggest whether ICFRE or some other organization shall be entrusted for future work.

Agenda item 12.8: Any other item with the permission of the Chairman

Discussion on the Report of the Site visit undertaken by EAC(Sub-Committee), River Valley & Hydro-electric Visit on 21.06.2023 to 25.06.2023 at Shongtong-Karcham (402 MW) Hydroelectric Power Project in District Kinnaur of Himachal Pradesh by M/s Shongtong Karchham Hydro Electric Project, HPPCL

1. The proposal for Extension of Validity of Environmental Clearance of Shongtong-Karcham (402 MW) Hydroelectric Power Project in an area of 77.33ha land in District Kinnaur of Himachal Pradesh by M/s Himachal Pradesh Power Corporation Ltd was submitted on Parivesh Portal on 10th November, 2022. Accordingly, the proposal was considered by the Sectoral EAC, River Valley and Hydro-electric, in its 37th meeting held on 30.11.2022 wherein the proposal was deferred due to inadequacy of information submitted by the PP to estimate the damage caused to the environment due to start of project construction for increased capacity i.e.450 MW.

2. The Sub Committee of EAC members visited the site on 21.06.2023 to 25.06.2023. Following expert members of the EAC have visited the project site of Shongtong-Karcham (402 MW) Hydroelectric Power Project:

   i. Dr. A.K. Malhotra
   ii. Dr. Uday Kumar R. Y.
   iii. Shri Yogendra Pal Singh - MoEF&CC representative

3. All the major sites connected with the Project i.e. barrage site, surge shaft site, power house site and different muck dumping sites were visited. The concreting work going on in Barrage could not be fully seen as the flood in the river had overtopped the coffer dam only in the previous night of the visit. The complicated engineering arrangements/designs, which are there in hydro projects were explained by HPPCL team through the schematic depiction maps along with progress of different components.

4. After the conclusion of the site visit in the forenoon, sub-committee had a meeting with the representative of the project proponent's team headed by Director (C) HPPCL. All the issues brought out in the minutes of the 37th EAC meeting were discussed.

5. The sub-committee after site visit made following recommendations:

   i. As per scientific studies conducted in the region, the project site is located in fragile geological region with good presence of flora and fauna, so sustainable planning and

management of hydropower is necessary in the region. Restoration of parts of river and catchments most impacted by ongoing and completed infrastructure needs attention of developer while implementing Catchment Area Treatment Plan. The project developer has not followed the recommendations of the Expert Appraisal Committee (EAC) made in its meeting held in August, 2020 w.r.t. submission of application for amendment in Environmental Clearance in view of changed project profile. The project has also violated the condition mentioned in the Environmental Clearance, issued by the Ministry vide letter dated 19.05.2011, which states that *"Any change in the scope of the project shall be intimated to the Ministry and fresh approval if required, shall be taken from the Ministry"*. Accordingly, the project developer may be advised to submit information on the following:

a. The revised EMP along with status of implementation of the present EMP. Steps taken to mitigate the impacts of additional muck generation.
b. Status of implementation of Catchment Area Treatment Plan, R&R and other Management Measures.
c. Action Plan for maintaining the E-Flow.

ii. The recommendations of the CIA&CCS of Satluj River Basin with regard to reduction in capacity of the Shongtong-Karcham (402 MW) Hydroelectric Power Project may not be applicable as the Environmental Clearance for the project was granted by the Ministry in the year 2012 and the project has attained considerable progress physically and financially both; whereas, the recommendations of the CIA&CCS of Satluj River Basin are still under consideration in the Ministry.

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

The meeting ended with vote of thanks to the Chair.

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ANNEXURE

ATTENDANCE

12th MEETING OF EXPERT APPRAISAL COMMITTEE (EAC)
RIVER VALLEY AND HYDROELECTRIC PROJECTS

DATE : **18th - 19th July 2024**

TIME : **10.30 AM onwards**

VENUE : **Narmada Hall, Jal Block, Indira Paryavaran Bhawan, New Delhi.**

Sl.No.	Name of Member	Role	Signature (18.07.2024)	Signature (19.07.2024)
1.	**Prof. G. J. Chakrapani**	**Chairman**		
2.	**Dr. Udaykumar R. Y.**	Member		
3.	**Dr. Mukesh Sharma**	Member	–	–
4.	**Dr. J V Tyagi**	Member	18/7/24	19/7/24
5.	**Shri Kartik Sapre**	Member		
6.	**Shri Ajay Kumar Lal**	Member		
7.	**Shri Rajeev Varshney**	Member Representative of Central Electricity Authority (CEA)	18/7/24	19/7/24
8.	**Shri Alok Paul Kalsi**	Member Representative of Central Water Commission (CWC)	–	–
9.	**Dr. J.A. Johnson**	Member Representative of Wildlife Institute of India (WII)	–	–
10.	**Dr. A.K. Sahoo**	Member Representative of Central Inland Fisheries Research Institute (CIFRI)	–	–
11.	**Shri Yogendra Pal Singh**	Member Secretary (River Valley and Hydroelectric Projects), MoEF&CC		

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Annexure-I

Report of the Site visit undertaken by EAC(Sub-Committee), River Valley & Hydro-electric Visit on 21.06.2023 to 25.06.2023 at Shongtong-Karcham (402 MW) Hydroelectric Power Project in District Kinnaur of Himachal Pradesh by M/s Shongtong Karchham Hydro Electric Project, HPPCL

1. The proposal for Extension of Validity of Environmental Clearance of Shongtong-Karcham (402 MW) Hydroelectric Power Project in an area of 77.33ha land in District Kinnaur of Himachal Pradesh by M/s Himachal Pradesh Power Corporation Ltd was submitted on Parivesh Portal on 10th November, 2022. Accordingly, the proposal was considered by the Sectoral EAC, River Valley and Hydro-electric, in its 37th meeting held on 30.11.2022 wherein the proposal was deferred with following observations:

   "*The EAC after detailed deliberations was of the view that the since PP has enhanced the capacity of the project from 402 MW to 450MW without taking prior consent of the MoEF&CC. Furthermore, recommendations made by the EAC on 31st August, 2020 were also not followed. The EAC also observed that information submitted by PP is not adequate to estimate the damage caused to the environment due to start of project construction for increased capacity i.e.450 MW. Accordingly, the EAC decided to conduct a site visit by following EAC sub-committee members before making any recommendations on proposal:*

i.	*Dr. A.K. Malhotra*	-	*Chairman*
ii.	*Dr. N. Lakshman*	-	*Member*
iii.	*Shri Sharvan Kumar*	-	*Member*
iv.	*Dr. Uday Kumar R. Y.*	-	*Member*
vi.	*Representative from MoEF&CC*	-	*Member*

   The Chairman, EAC co-opted Shri K. Gowarappan, environmental damage assessment expert/ex-member of the Violation Committee, MoEF&CC as a member of the sub-committee who will conduct the site visit.

   The EAC therefore deferred the project for site visit."

2. The Sub Committee of EAC members visited the site on 21.06.2023 to 25.06.2023. Following expert members of the EAC have visited the project site of Shongtong-Karcham (402 MW) Hydroelectric Power Project:

   iv. Dr. A.K. Malhotra
   v. Dr. Uday Kumar R. Y.

vi. Shri Yogendra Pal Singh - MoEF&CC representative

3. All the major sites connected with the Project i.e. barrage site, surge shaft site, power house site and different muck dumping sites were visited. The concreting work going on in Barrage could not be fully seen as the flood in the river had overtopped the coffer dam only in the previous night of the visit. The complicated engineering arrangements/designs, which are there in hydro projects were explained by HPPCL team through the schematic depiction maps along with progress of different components.

4. After the conclusion of the site visit in the forenoon, sub-committee had a meeting with the representative of the project proponent's team headed by Director (C) HPPCL. All the issues brought out in the minutes of the 37th EAC meeting were discussed.

Background of the project

i. The MoEF&CC accorded Environmental Clearance vide letter No. F. No. J-12011/58/2007-IA-I dated 19.05.2011 to the project Shongtong-Karcham Hydroelectric Power Project for 402 MW capacity in an area of 77.33ha land in District Kinnaur of Himachal Pradesh by M/s Himachal Pradesh Power Corporation Ltd. The MoEF&CC accorded Forest Clearance (Stage-II) for diversion of 63.05 ha Forest land for construction of Shongtong-Karcham Hydroelectric Power Project (402 MW) vide letter no. F. No. 8-78/2010-FC dated 14.11.2012.

ii. The project is envisaged as a run-of the river (RoR) Scheme on river Satluj in district Kinnaur, Himanchal Pradesh. The barrage site is located near village Powari and the power house is proposed to be located near village Ralli on left bank of river Satluj near confluence of river Bapsa with river Satluj.

iii. In the course of firming up of hydrological data (i.e. design head and design discharge) the Central Water Commission (CWC) advised that installed capacity of the project could be increased from 402 MW to 450 MW. The Techno Economic Clearance (TEC) for the enhanced capacity of 450 MW was granted by Central Electricity Authority (CEA), vide its letter no. 2/HP/CEA/07-PAC/5066-97, dated 08/08/2012.

iv. HPPCL applied for the revalidation of Environmental Clearance from 402 MW to 450 MW vide is letter no. HPPCL/GM-SKHEP/EC-Vol.-I/2013-2374-85, dated 29/07/2013.

v. The Proposed project was appraised in the 70th meeting of EAC held on 10th December, 2013. The committee noted that:

b. There are no changes in the environmental impacts.

c. All conditions under Environmental Clearance (earlier granted by MoEF, GOI) are being complied with.
d. EC already granted holds good for the enhanced capacity also.
e. Committee recommended the revalidation of EC to 450 MW capacity subject to the revised EMP presented by HPPCL in the meeting.

vi. The E-flow study as required in the EC dated 19/05/2012 was presented by HPPCL in 78th meeting of EAC held on 16 & 17th October 2014. The EAC acknowledged and directed that:

a. Studies were in order, and advised to carry out studies through Hydraulic Rating and Habitat Simulation method for further clarity.
b. Comparative changes in the EMP and updated estimated cost due to enhancement of installed capacity shall be included and submitted.
c. Public Consultation process for 450 MW to be completed.

vii. The MOFF&CC conducted a Cumulative Environment Impact Assessment (CEIA) of Satluj Basin which was recommended for approval by EAC during December, 2019. The CEIA Study made two recommendations with respect to Shongtong Karchham HEP as under:

a. To meet with the oxygen rejuvenation of the river, certain distance needs to be maintained between two successive projects in cascade. Based on this Shongtong Karchham HEP (450MW) will require revision in head. Installed capacity of the Shongtong Karchham HEP was recommended to be reduced to 387 MW as per Satluj Basin Study.

b. Enhanced Environmental Flow Requirement in the diverted river stretch of Shongtong Karchham HEP.

viii. CEIA Study for Satluj basin was discussed in 2nd meeting of EAC in Aug 2020, the observations are given as below:

a. Project proponent should immediately finalize the installed capacity keeping in view the recommendations of Satluj Basin study.

b. Apply for Amendment of EC accordingly to get scoping for updating EIA study, complete the public consultation process, and then apply for appraisal.

5. On the issue of recommendation made in 2nd meeting of EAC on 31.08.2020 regarding freezing of the project capacity on the lines of cumulative environment impact assessment (CEIA) study conducted by ICFRE Dehradun, it was submitted by HPPCL that the project is under construction since 2012. As of now project has attained overall progress of more than 50% **(Dam construction-11.51%, Power house 60.02% and surge Shaft 63.33%).** Also**,** almost all the E&M equipments i.e. turbines, generators etc. manufactured for the capacity of 450 MW have been procured and transported to site stores. Therefore, it was too late to revisit the domain.
6. It was also submitted that the objective of oxygenation to be attained by leaving free stretches of the river between successive projects was already fulfilled to great extent as the upstream developer has already moved the power house of Jangi Thopan Powari Project upstream, thereby creating a free stretch of ± 2.5 km on upstream side of Shongtong Barrage. Also, the project proponent i.e. HPPCL has already committed to release enhanced E flow as per the recommendations of the CEIA report.

7. Accordingly, sub-committee made following recommendations:

    i. As per scientific studies conducted in the region, the project site is located in fragile geological region with good presence of flora and fauna, so sustainable planning and management of hydropower is necessary in the region. Restoration of parts of river and catchments most impacted by ongoing and completed infrastructure needs attention of developer while implementing Catchment Area Treatment Plan. The project developer has not followed the recommendations of the Expert Appraisal Committee (EAC) made in its meeting held in August, 2020 w.r.t. submission of application for amendment in Environmental Clearance in view of changed project profile. The project has also violated the condition mentioned in the Environmental Clearance, issued by the Ministry vide letter dated 19.05.2011, which states that *"Any change in the scope of the project shall be intimated to the Ministry and fresh approval if required, shall be taken from the Ministry"*. Accordingly, the project developer may be advised to submit information on the following:
        - **a.** The revised EMP along with status of implementation of the present EMP. Steps taken to mitigate the impacts of additional muck generation.
        - **b.** Status of implementation of Catchment Area Treatment Plan, R&R and other Management Measures.
        - **c.** Action Plan for maintaining the E-Flow.

    ii. The recommendations of the CIA&CCS of Satluj River Basin with regard to reduction in capacity of the Shongtong-Karcham (402 MW) Hydroelectric Power Project may not be applicable as the Environmental Clearance for the project was granted by the Ministry in the year 2012 and the project has attained considerable progress physically and financially

both; whereas, the recommendations of the CIA&CCS of Satluj River Basin are still under consideration in the Ministry.

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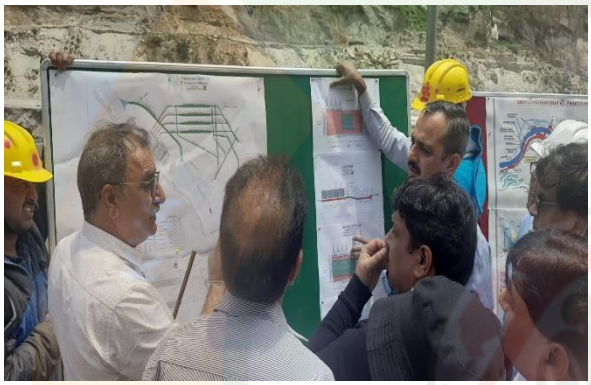
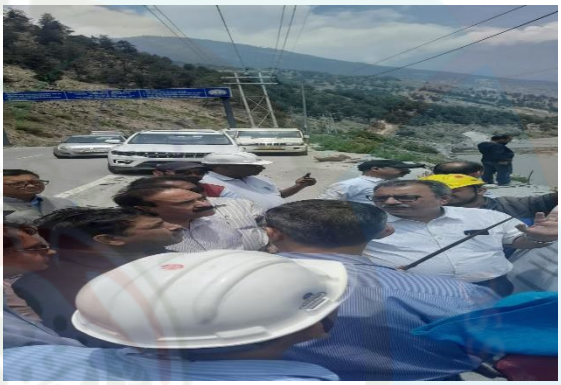
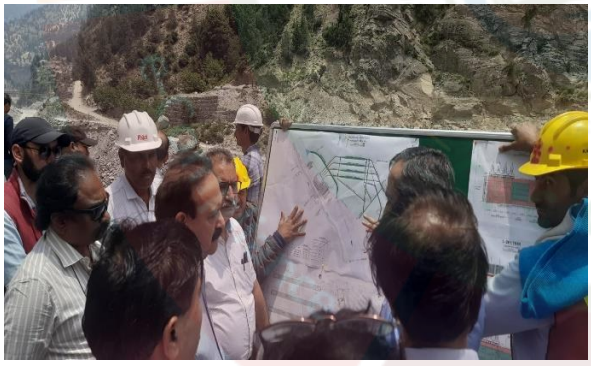
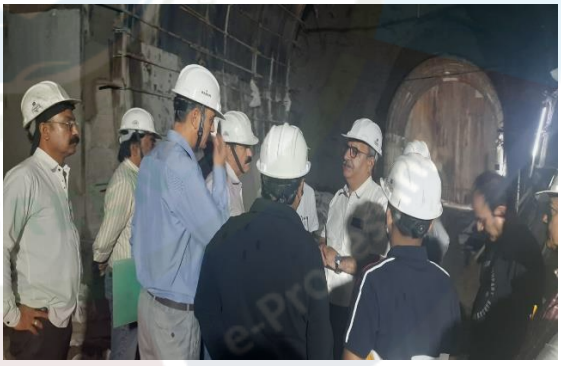
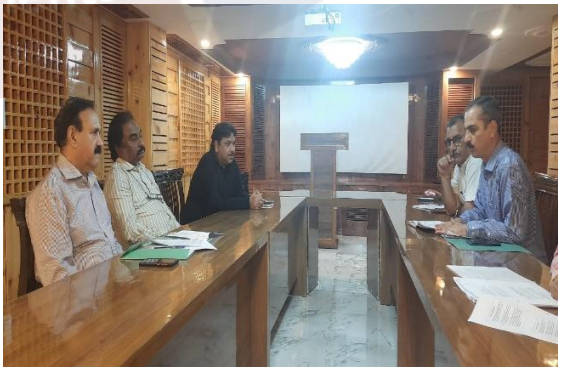
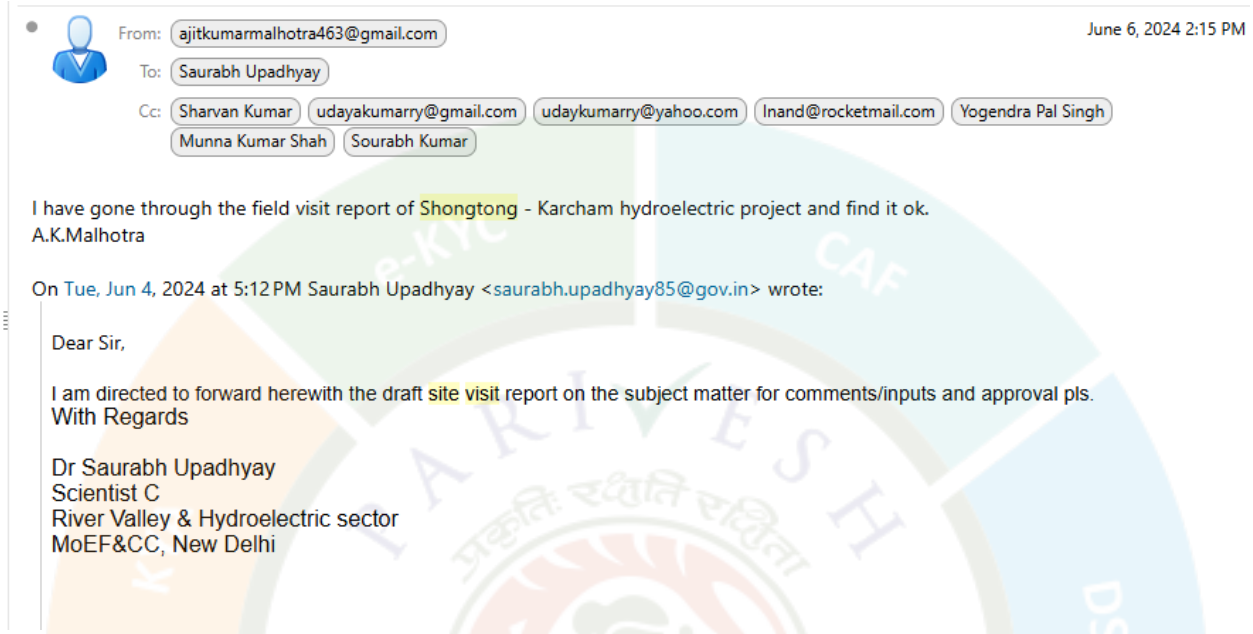







APPROVAL OF THE CHAIRMAN FOR SITE VISIT REPORT



From: ajitkumarmalhotra463@gmail.com
June 6, 2024 2:15 PM
To: Saurabh Upadhyay
Cc: Sharvan Kumar, udayakumarry@gmail.com, udaykumarry@yahoo.com, lnand@rocketmail.com, Yogendra Pal Singh, Munna Kumar Shah, Sourabh Kumar

I have gone through the field visit report of Shongtong - Karcham hydroelectric project and find it ok.
A.K.Malhotra

On Tue, Jun 4, 2024 at 5:12 PM Saurabh Upadhyay <saurabh.upadhyay85@gov.in> wrote:

> Dear Sir,
>
> I am directed to forward herewith the draft site visit report on the subject matter for comments/inputs and approval pls.
> With Regards
>
> Dr Saurabh Upadhyay
> Scientist C
> River Valley & Hydroelectric sector
> MoEF&CC, New Delhi