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

सत्यमेव जयते

Minutes of AGENDA OF 21ST MEETING OF THE EXPERT APPRAISAL COM MITTEE ON meeting River Valley and Hydroelectric Projects held from 31/12/2024 to 31/12/2024 **Date:** 09/01/2025

MoM ID: EC/MOM/EAC/229015/12/2024

Agenda ID: EC/AGENDA/EAC/229015/12/2024

Meeting Venue: N/A

Meeting Mode: Virtual

Date & Time:

31/12/2024	10:30 AM	05:30 PM

1. Opening remarks

The 21st meeting of the EAC for River Valley & Hydro-electric Projects organized by the Ministry of Environment, Forest and Climate Change, Indira Paryavaran Bhawan, Jor Bagh Road, New Delhi, was held on Virtual mode, under the Chairmanship of Prof. G. J. Chakrapani.

2. Confirmation of the minutes of previous meeting

The Minutes of the Meeting held on 19th EAC meeting on 19th December, 2024 were confirmed.

3. Details of proposals considered by the committee

Day 1 -31/12/2024

3.1. Agenda Item No 1:

3.1.1. Details of the proposal

Tarali Pumping Storage Project (1500 MW) by **ADANI GREEN ENERGY LIMITED** located at **SATARA,MAHARASHTRA**			
Proposal For		Fresh EC	
Proposal No	**File No**	**Submission Date**	**Activity (Schedule Item)**
IA/MH/RIV/487971/2024	J-12011/52/2023-IA.I (R)	10/12/2024	River Valley/Irrigation projects (1(c))

3.1.2. Project Salient Features

21.1.1: The proposal is for grant of Environmental Clearance (EC) to the project for Tarali Open Loop Pumped Storage Project (1500 MW) in an area of 150.74 Ha located at Village Nivade, Tondoshi, Kalambe and Jalu, Sub District Patan, District Satara, Maharashtra by M/s Adani Green Energy Limited.

21.1.2: The Project Proponent and the accredited Consultant R. S. Envirolinks Technologies Pvt. Ltd., made a detailed presentation on the salient features of the project and informed that:

i. The proposed Tarali Pumped Storage Project is envisaged with a proposed installed capacity of 1500 MW (4 x 300 MW + 2 x 150 MW) located in the Satara district of Maharashtra, and is being developed by Adani Green Energy Ltd.

ii. The Tarali Pumped Storage Project will comprise of two reservoirs i.e. Tarali reservoir (already existing) and Upper Reservoir (to be constructed). The project is located in Kalambe, Nivade, Tandoshi and Dafalwadi villages, Patan Taluka of Satara District of Maharashtra. It envisages construction of upper reservoir in Kalambe village in Patan Taluka of Satara District and use the existing Tarali lake as Lower reservoir in Nivade Village of Patan Taluka, Satara District

iii. The geographical co-ordinate of the project are

Upper Dam: Longitude - 73°53'19.97"E

Latitude - 17°30'27.38"N

Lower Dam: Longitude - 73°53'54.11"E

v. The proposed Scheme will involve construction of 61.5 m high dam for creation of Tarali PSP Upper Reservoir with 11.36 MCM (0.40 TMC) gross storage capacity. Both the reservoirs are planned to be interconnected through water conductor system and the reversible generator pump turbine would be installed in the surface/ pit powerhouse. 2 nos. of pressure shaft further bifurcated into 6 nos. of independent Penstock will be taking off from Intake structure provided with Trash rack and Gates located in upper reservoir. Pit type Powerhouse will be located on the downstream of the intake structure and shall be equipped with 6 Vertical Reversible Francis type units composed each of generator/motor and a pump/turbine having generated capacity of Four units of 300 MW each and 2 Units of 150 MW each.

vi. The total design discharge for the proposed scheme is 90.15 m3 /s per turbine during generation and 78.57 m3 /s during pumping with the rated head of 380.43m during generation and 394.33m during pumping mode. The scheme is envisaged to meet the peak demand of about 6.5 hours with an estimated annual energy generation of 3365.48 MU.

vii. The project proposal was considered by the Expert Appraisal Committee (River Valley and Hydropower Projects) in its meetings held on 14.09.2022 recommended for grant of Terms of Reference (ToRs). The ToR was accorded by Ministry of Environment Forests and Climate Change (MoEF&CC), Government of India vide letter no. J-12011/14/2022-IA. I(R) dated 9.11.2022. Due to change in location and configuration of project components; amendment in ToR for 1500 MW installed capacity approved in EAC meeting of 17.10.2023 and TOR amendment letter issued on 3.01.2024.

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

All project components as well as the entire study area fall under Patan and Satara tehsils in Satara district. There are 97 villages in the study area. Out of 97 villages, 75 are in Patan tehsil, and 22 are in Satara tehsil.

The baseline socio-economic profile is based on a field survey and the Census of India 2011. The total population of the study area is 74765 people, with 36357 males (48.62%) and 38408 females (51.37%). There are 16337 households, with an average occupancy of 4 to 5 people per house. The number of children under the age of six was found to be 8786, accounting for 11.75% of the total population. The sex ratio was found to be 1056 females per 1000 males.

There are 4942 scheduled castes population, accounting for 6.61% of the total population, with 2391 scheduled caste males and 2551 scheduled caste females. There are 543 scheduled tribes in total, accounting for 0.72% of the total population, with 283 scheduled tribe males and 260 scheduled tribe females.

The literacy rate in the study area is 75.37% (above the 6-year-old population), with males and females having rates of 87.10% and 65.10%, respectively, creating a gender gap of 22%.

According to the 2011 census total population of workers in the study area is 36824 (49.25%). Out of the total worker Main and marginal workers were 31459 (85.43%) and 5365 (14.56%) respectively.

Main and marginal workers are classified into four categories: cultivators, agricultural workers, household industry workers, and other workers. As per the 2011 census, out of a total of 36824 workers in the study area, 80.08% of the working population are engaged in agriculture and allied services, out of which 58.80% are cultivators and 21.28% are agricultural labourers. Only a small percentage of the population engaged in household industry 3.42%, and 16.49% of the population engaged in other services, viz., trade, commerce, business, transport, government, and private jobs.

ix. **Water requirement**: The water requirement for the upper reservoir initial filling up to MDDL (one-time) is about 0.94 Mm3 and water required from the existing lower reservoir for operation of PSP is 10.42 Mm3. The annual water requirement for recuperating losses in upper reservoir storage due to evaporation, transit etc. has been estimated to be about 0.46 Mm.

x. **Project Cost**: The estimated project cost is Rs 5675.0 crore. Total capital cost earmarked towards Environment Management Plan/environmental pollution control measures is Rs. 3934.08 lakh and the Recurring cost (operation and maintenance) will be about Rs. 2753.20 lakh.

xi. **Project Benefit:** Total Employment will be 1000 persons as direct & persons indirect after expansion. Industry proposes to allocate Rs. 2124.12 Lakh towards CER (as per Ministry's OM dated 30th Sep 2020).

xii. **Environmental Sensitive area:** No project component falls in any notified protected area. Nearest protected areas to the project components are Sahyadri Tiger Reserve and Koyna Wildlife Sanctuary, which are at the distance of 1.5 km and 3.2 km, respectively. As the Eco-sensitive zones (ESZ) are not notified, project will undergo Wildlife Clearance from National Board of Wildlife (NBWL).

xiii. MOU signed with Maharashtra State Government on 28th June 2022.

xiv. **Resettlement and rehabilitation:** The entire private land identified for the project falls in four revenue villages namely Kalambe, Nivade, Dafalwadi and Tondoshi villages of Patan Taluka of Satara District of Maharashtra. Due to in the proximity of project area and issues raised by villagers during public hearing, Dafalwadi village was also considered as project affected village. The private land identified for the projects belongs to landowner families who will be losing their partial agricultural land holding and none of the families will be losing any house or any other assets. None of them is getting displaced due to the project from the above land procurement.

xv. **Alternative Studies:** Three alternative layouts are studied for Tarali PSP. For these three layouts two alternative locations of upper reservoirs (UR-1 and UR-2) and two alternative locations of powerhouse (PH-1 and PH-2) have been explored, whereas lower reservoir is kept same for all the options. Considering lesser excavation in powerhouse (PH-2) and lesser length of dam, higher storage capacity (UR-2) in reservoir, the Alternative-3 (UR-2 + PH-2 + LR) appears to be preferable than other two Alternatives-1 & 2. Hence, Alternative-3 is considered for further study.

i. Baseline Environmental Scenario:

Period	**From January 2023 To May 2023**
AAQ parame	**Unit in µg/m^3**

ters at 10 locations (min. & Max.)

Core	Min	Max	Standards
$PM_{2.5}$	10.30	16.70	60
PM_{10}	25.40	37.50	100
SO_2	4.00	5.20	80
NO_2	4.30	5.50	80
Buffer	**Min**	**Max**	
$PM_{2.5}$	9.30	23.50	60
PM_{10}	25.10	52.90	100
SO_2	3.60	7.30	80
NO_2	3.90	7.80	80

Incremental GLC Level

Criteria Pollutant [PM_{10}, $PM_{2.5}$, SO_2, NO_x, Other parameters specific to the sector (Please specify)]	Unit [µg/m^3]	Baseline Concentration [A]	Predicted incremental value considering worst case stability class [B]	Total GLC [A]+[B]	
Core Zone					
PM10	µg/m^3	39.0	8.5	47.5	
PM2.5	µg/m^3	13.5	22	35.5	
SOx	µg/m^3	4.6	18	22.6	
NOx	µg/m^3	4.9	25	29.9	
Buffer Zone					
PM10	µg/m^3	39.0	8.5	47.5	
PM2.5	µg/m^3	16.40	6	22.4	
SOx	µg/m^3	5.45	7	12.45	
NOx	µg/m^3	4.85	8	12.85	

River water samples (04 samples)

	Core Zone			
S. No	**Parameters**	**Min**	**Max**	**Standards**
1	pH	6.8	7.25	8.5
2	Total Dissolved Solids, mg/L	13	45	500
3	Dissolved Oxygen (mg/l)	6.3	8.8	3
4	Chloride (as Cl), mg/L	1.9	12.6	0
5	Total Hardness (as CaCO3), mg/L	10	25.3	200
6	Biological Oxygen Demand (mg/l)	2	2	2
7	Chemical Oxygen Demand (mg/l)	6	6	0
8	Total Coliform (MPN/100 ml)	26	67	50

Buffer Zone

S. No	Parameters	Min	Max	Standards
1	pH	6.7	7.42	8.5

2	Total Dissolved Solids, mg/L	31	70	500
3	Dissolved Oxygen (mg/l)	6.5	7.7	3
4	Chloride (as Cl), mg/L	4.5	7.6	0
5	Total Hardness (as CaCO3), mg/L	16.3	20.9	200
6	Biological Oxygen Demand (mg/l)	2	2	2
7	Chemical Oxygen Demand (mg/l)	6	6	0
8	Total Coliform (MPN/100 ml)	21	55	50

Pond water samples

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Groundwater water samples quality at 0 location

Core Zone

S. No	Parameters	Min	Max	Standards
1	pH	6.5	7.9	6.5
2	Total Dissolved Solids, mg/L	49	226	500
3	Chloride (as Cl), mg/L	20	64	250
4	Total Hardness (as CaCO3), mg/L	83.7	184.7	200
5	Fluoride	0.05	0.13	1

Buffer Zone

S. No	Parameters	Min	Max	Standards
1	pH	6.5	7.49	6.5
2	Total Dissolved Solids, mg/L	42	281	500
3	Chloride (as Cl), mg/L	15	72	250
4	Total Hardness (as CaCO3), mg/L	90.3	154.4	200
5	Fluoride	0.07	0.36	1

Noise levels Leq (Day & Night) at 10 locations

Noise Level	Zone	Leq Day d B(A)		Leq Night d B(A)		Prescribed Limits	
		From	To	From	To	Day	Night
Core	Residential	46.7	51.1	36.1	39.40	55	45
Buffer	Residential	48.2	54	37.2	41.70	55	45

Soil Quality at 10 Locations

Core Zone

S. No.	Parameters	Min	Max	Prescribed Limits
1	Calcium (mg/kg)	114	272	500
2	Sodium Absorption Ratio	1.3	1.9	10
3	Phosphorus (kg/ha)	6.5	11.6	50
4	Carbon (%)	0.66	0.8	1
5	Salinity (ppt)	0	0	0.01
6	Magnesium (mg/kg)	55	202	500
7	Nitrogen (kg/ha)	230	342	500
8	Potassium (kg/ha)	219	449	500
Buffer Zone				
1	Calcium (mg/kg)	41	157	500
2	Sodium Absorption Ratio	1.1	3.8	10
3	Phosphorus (kg/ha)	7.8	25.7	50

4	Carbon (%)	0.55	0.9	1
5	Salinity (ppt)	0	0	0.01
6	Magnesium (mg/kg)	23	101	500
7	Nitrogen (kg/ha)	180	323	500
8	Potassium (kg/ha)	220	332	500

Flora & Fauna	Schedule-I species observed in the study area: As per Wildlife Protection Amendment Act, 2022, Sambar Deer, Indian Bison, Four-horned Antelope, Common Leopard, Indian Fox, Jackal, Grey Wolf, Indian Grey Mongoose, Striped Hyena, Sloth Bear, Indian Pangolin, Porcupine, White-eyed Buzzard, Cobra are listed as Schedule I species.

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

- The generated muck will be carried in dumper trucks covered with heavy duty tarpaulin properly tied to the vehicle in accordance with best international practices. All precautionary measures will be followed during the dumping of muck. All dumpers will be well maintained to avoid any chances of loose soil from being falling during transportation. All routes will be periodically wetted with the help of sprinklers prior to the movement of dumper trucks. Dumping would be avoided during the high-speed wind, so that suspended particulate matters (SPM) level could be maintained. Further, dumping will be avoided during heavy traffic. After the dumping the surface of dumps will be sprayed with water with the help of sprinklers and then compacted.
- Four muck disposal yards has been identified with a total area of 35.0 ha and capacity has been worked as 17,77,530 cum.
- The disposal site was identified taking into consideration availability of suitable area, minimum distance from generation sites.

iii. Public Hearing for the proposed project has been conducted by the Maharashtra Pollution Control Committee on 12.03.2024 at Satara district, Maharashtra. The meeting was chaired by Resident Deputy Collector & Upper District Magistrate, District Satara. The main issues raised and replies by the user agency during the public hearing are detailed in the Public Hearing report submitted on PARIVESH.

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

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

	S. No.	**Component of EMP**	**Capital Cost**	**Recurring Cost (Rs. in lakh)**					**Total Cost**
			(Rs. in lakh)	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**(Rs. in lakh)**
1		**EAC MEETING DETAILS**							

S. No.	Component of EMP	Capital Cost	Recurring Cost (Rs. in lakh)					Total Cost
		(Rs. in lakh)	Year 1	Year 2	Year 3	Year 4	Year 5	(Rs. in lakh)

i	EAC meeting/s	:	21st EAC Meeting	
ii	Date of Meeting/s	:	31.12.2024	
iii	Date of earlier EAC meetings	:	14.09.2022 (TOR) & 17.10.2023 (TOR amendment)	
2	**PROJECT DETAILS**			
i	Name of the Proposal	:	Tarali Open Loop Pumped Storage Project (1500 MW)	
ii	Proposal No.	:	IA/MH/RIV/487971/2024	
iii	Location (including coordinates)	:	Tarali PSP is located near Dangistewadi village, Patan Taluka of Satara District of Maharashtra.	
			Reservoir	**Latitude**
			Lower Reservoir	17°32'00.14"N

Longitude

73°53'54.1

S. No.	Component of EMP	Capital Cost	Recurring Cost (Rs. in lakh)					Total Cost
		(Rs. in lakh)	Year 1	Year 2	Year 3	Year 4	Year 5	(Rs. in lakh)
								1" E
						Upper Reservoir	17°30'27.38"N	73°53'19.97" E
iv	Company's Name		:	M/s Adani Green Energy Limited				
v	CIN no. of Company/user agency		:	U40106GJ2015PLC082007				
vi	Accredited Consultant and certificate no.		:	NABET/EIA/2225/RA 0274				
vii	Project location (Coordinates /River/ Reservoir)		:	Near Village: Nivade, Tondoshi, Kalambe and Jalu				
viii	Interstate Issue		:	No				
ix	Proposed on River/ Reservoir		:	Tarali Resevoir				
x	Type of Hydro-electric project		:	Pumped Storage Project				
xi	Seismic Zone		:	Zone-IV				

S. No.	Component of EMP	Capital Cost	Recurring Cost (Rs. in lakh)					Total Cost
		(Rs. in lakh)	Year 1	Year 2	Year 3	Year 4	Year 5	(Rs. in lakh)
3	**CATEGORY DETAILS**							
i	Category of the project		:	A				
ii	Capacity / ~~Cultural command area (CCA)~~		:	1500MW				
iii	Attracts the General Conditions (Yes/No)		:	Yes				
v	Additional Information if any		:	No				
4	**TOR/EC DETAILS**							
i	ToR Proposal No.		:	IA/MH/RIV/289096/2022				
ii	EAC meeting date		:	14.09.2022 (TOR) & 17.10.2023 (TOR amendment)				
iii	ToR Letter No.		:	J-12011/14/2018-IA-I (R) & J-12011/52/2023-IA-I (R)				
iv	ToR grant Date		:	09.11.2022 (TOR) & 03.01.2024 (TOR amendment)				
v	Cost of project		:	INR 5675.0 Cr				
vi	Total area of Project		:	150.74 Ha				
vii	Height of Dam from River Bed (EL)		:	61.5 m (Upper Dam)				

S. No.	Component of EMP	Capital Cost	Recurring Cost (Rs. in lakh)					Total Cost
		(Rs. in lakh)	Year 1	Year 2	Year 3	Year 4	Year 5	(Rs. in lakh)

viii	Details of submergence area	:	51.93 ha
ix	District to provide irrigation facility (if applicable)	:	NA
x	Details of tunnels on upper level & lower level and length of canal (if applicable)	:	
xi	No. of affected Village	:	4
xii	No. of Affected Families	:	325
xiii	Project Benefits	:	**Power Generation**:
			As the Tarali PSP (1500 MW) will come into operation, the electricity generated using the renewable source of energy (i.e. water) is more as compare to the use of fossil fuel. Thus, Air pollution will be much lesser in the given area as the pump storage project get commence. Moreover, while building the project there will be no loss of forest land. For construction of Tarali PSP, no forest land shall be diverted. To develop Greenbelt in the surrounding of project area, plantation over 40.0ha is proposed over restored temporary construction sites and muck dumping area. Watershed development plan has been prepared for soil conserv

S. No.	Component of EMP	Capital Cost (Rs. in lakh)	Recurring Cost (Rs. in lakh)					Total Cost (Rs. in lakh)
			Year 1	Year 2	Year 3	Year 4	Year 5	
						ation and management of water resources in the study area with financial provision of **Rs. 38.79 lakh**. A financial provision of **Rs. 20. 98 crore** has been allocated for strengthening and development of basic infrastructural facilities with a view to improve the quali ty of life of residents in the proje ct vicinity. In addition, the project would le ad to creation of direct and indir ect employment opportunities as new factories would come up in and around the project due to rel iable power supply/availability, contract works for the locals dur ing construction and operation p hase, etc. The project may also increase re creation and tourism potential to gether with development of infr astructural facilities in the area. All these activities have positive impact on socio-economic envir onment and will increases the ec onomic status of the people and hence there would be all-round development of the region.					
xiv	R&R details		:			The entire private land identifie d for the project falls in four rev enue villages namely Kalambe, Nivade, Dafalwadi and Tondosh i villages of Patan Taluka of Sat ara District of Maharashtra. Due					

S. No.	Component of EMP	Capital Cost	Recurring Cost (Rs. in lakh)					Total Cost
		(Rs. in lakh)	Year 1	Year 2	Year 3	Year 4	Year 5	(Rs. in lakh)
							to in the proximity of project area and issues raised by villagers during public hearing, Dafalwadi village was also considered as project affected village. The private land identified for the projects belongs to landowner families who will be losing their partial agricultural land holding and none of the families will be losing any house or any other assets. None of them is getting displaced due to the project from the above land procurement.	
xv	Catchment area/ Command area	:	Catchment Area: 1.18 sq km (Upper Reservoir)					
xvi	Types of Waste and quantity of generation during construction/ Operation	:	Municipal Solid Waste- Bio degradable (551.80 Tons), Non degradable (236.52 Tons)					
xvii	Material used for blasting and its composition as per DGMS standards.	:	Explosive magazine of adequate capacity would be constructed to store the explosives required for the construction of the project components. It has been assessed that one magazine of 20 MT capacities would be sufficient to meet the requirement of the project. A mobile explosive van shall be deployed to carry explosive at the site of use at upper and powerhouse area. Movement of van should be done with armed guards and proper documentation r					

S. No.	Component of EMP	Capital Cost	Recurring Cost (Rs. in lakh)					Total Cost
		(Rs. in lakh)	Year 1	Year 2	Year 3	Year 4	Year 5	(Rs. in lakh)
					ecommended by PESO.			
xviii	E-Flows for the Project		:		Proposed PSP is a pumped storage scheme and doesn't involve building any dam/barrage on river Tarali and will not be diverting any water from river Tarali. Only evaporation and transmission losses from upper reservoir of 0.46 Mm3 will be compensated from upper reservoir. Water required for daily generation is 10.42 MCM, the requirement has been adequately reviewed by WRD and water allocation is made with out impacting existing users. After analysing the present water utilization catered by Tarali reservoir for drinking and irrigation purposes, Water Resource Department Maharashtra has granted the Industrial Water Entitlement (Bulk Water Entitlement) for Tarali Pumped Storage Project. As the project is not storing/ diverting water of river Tarali, e-flow of water in river Tarali will not be impacted by the project.			
xix	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&C		:		No			

S. No.	Component of EMP	Capital Cost	Recurring Cost (Rs. in lakh)					Total Cost
		(Rs. in lakh)	Year 1	Year 2	Year 3	Year 4	Year 5	(Rs. in lakh)
	C study of River Basin. d) If not the E-Flows maintain criteria for sustaining river ecosystem.							
xx	Details on provision of fish pass	:	No					
xxi	Project benefit including employment details (no of employee)	:	About 1000 workers (labour and staff) would be engaged during the peak construction period, out of which 250 persons will be engaged permanently and about 750 will be temporary labour for the construction work. It is expected that 70% of the total workforce shall be available from the State of Maharashtra. After completion of the project only a staff of about 200 technical persons shall be required for the operation of the project.					
xxii	Area of Compensatory Afforestation (CA) with tentative no of plantation.	:	Since, there is no requirement of any forest land diversion for construction of various components, therefore requirement of preparation of Compensatory Afforestation Plan is not applicable in the present case.					
xxiii	Previous EC details	:	-					
xiv	EC Compliance Report by R.O, MOEF&CC	:	-					

S. No.	Component of EMP	Capital Cost	Recurring Cost (Rs. in lakh)					Total Cost
		(Rs. in lakh)	Year 1	Year 2	Year 3	Year 4	Year 5	(Rs. in lakh)
6	**ELECTRICITY GENERATION CAPACITY**							
i	Powerhouse Installed Capacity	:	1500 MW					
ii	Generation of Electricity Annually	:	3365.48 MU					
iii	No. of Units	:	6 nos. (4 x 300 MW + 2 x 150MW)					
6	**MUCK MANAGEMENT DETAILS**							
i	No. of proposed disposal area/ (type of land- Forest/Pvt land)	:	4					
ii	Cross section of proposed muck area, Height of muck with slope.	:	Attached as Appendix I					
iii	Distance of muck disposal area (location), from muck generation sources (project area)/River, HFL of proposed muck disposal area.	:	Muck disposal area from upper reservoir is 750m Muck disposal area from power house are 650m, 900m and 2500m					
iv	Total Muck Disposal Area	:	35.0 ha					
v	Estimate Muck to be generated	:	2989569 Cum					
vi	Transportation	:	The generated muck will be carried in dumper trucks covered with heavy duty tarpaulin properly tied to the vehicle in accordance with best international practices. All precautionary measures will be followed during the dumping					

S. No.	Component of EMP	Capital Cost	Recurring Cost (Rs. in lakh)					Total Cost
		(Rs. in lakh)	Year 1	Year 2	Year 3	Year 4	Year 5	(Rs. in lakh)
							of muck. All dumpers will be well maintained to avoid any chances of loose soil from being falling during transportation. All routes will be periodically wetted with the help of sprinklers prior to the movement of dumper trucks. Dumping would be avoided during the high-speed wind, so that suspended particulate matters (SPM) level could be maintained. Further, dumping will be avoided during heavy traffic. After the dumping the surface of dumps will be sprayed with water with the help of sprinklers and then compacted.	
vii	Monitoring mechanism for Muck Disposal Transportation		:				The provisions of Monitoring have been kept under proposed Environmental Monitoring Plan.	
7	**LAND AREA BREAK-UP**							
i	Private Land		:				150.74 ha	
ii	Forest Land		:				0	
iii	Submergence area/Reservoir area		:				51.93 ha	
iv	Land required for project components		:				98.81 ha	
8	**PRESENCE OF ENVIRONMENTALLY SENSITIVE AREAS IN THE STUDY AREA**							

S. No.	Component of EMP	Capital Cost	Recurring Cost (Rs. in lakh)					Total Cost
		(Rs. in lakh)	Year 1	Year 2	Year 3	Year 4	Year 5	(Rs. in lakh)

S.no	Forest Land/ Protected Area/ Environmental Sensitivity Zone	Yes/ NO	Details of Certificate/letter/Remarks
i	Reserve Forest/Protected Forest Land	No	No project component falls in any notified protected area. The project components are proposed outside the buffer zone of Sahyadri Tiger Reserve. The nearest distance of project components from Koyna Wildlife Sanctuary is 3.2 km.
ii	National Park	No	
iii	Wildlife Sanctuary	Yes	
iv	Archaeological sites monuments/historical temples etc	No	
v	Additional information (if any)	-	

Availability of Schedule-I species in study area: As per Wildlife Protection Amendment Act, 2022, Sambar Deer, Indian Bison, Four-horned Antelope, Common Leopard, Indian Fox, Jackal, Grey Wolf, Indian Grey Mongoose, Striped Hyena, Sloth Bear, Indian Pangolin, Porcupine, White-eyed Buzzard, Cobra are listed as Schedule I species.

9	PUBLIC HEARING (PH) DETAILS		
i	Advertisement for PH with date	:	State level Marathi and English newspaper dated 07.02.2024
ii	Date of PH	:	12.03.2024
iii	Venue	:	Near Gagangiri Maharaj Math at Village Kalambe, taluka Patan, district Satara, Maharashtra
iv	Chaired by	:	Resident Deputy Collector & U

S. No.	Component of EMP	Capital Cost	Recurring Cost (Rs. in lakh)					Total Cost
		(Rs. in lakh)	Year 1	Year 2	Year 3	Year 4	Year 5	(Rs. in lakh)

			pper District Magistrate, District Satara
v	Main issues raised during PH	:	Concerns about Cattle grazing land; The area is vulnerable to landslide and soil erosion; Pazar lake; sewage from the workers colony living here gets mixed with the seepage pond, threatening the health of the village.
vi	No. of people attended	:	150
9	**BRIEF OF BASE LINE ENVIRONMENT**		
i	**Parameters**	:	**Winter**	**Pre-Monsoon/ Summer**
ii	Soil	:	January, 2023	April-May, 2023
iii	Air Environment	:	January-February, 2023	April-May, 2023
iv	Noise & Traffic	:	January, 2023	April-May, 2023
v	Water Quality	:	January, 2023	April-May, 2023
vi	Vegetation	:	January, 2023	April-May, 2023
vii	Fauna surveys	:	January, 2023	April-May, 2023

S. No.	Component of EMP	Capital Cost (Rs. in lakh)	Recurring Cost (Rs. in lakh)					Total Cost (Rs. in lakh)
			Year 1	Year 2	Year 3	Year 4	Year 5	
viii	Socio-economic survey	:	April-May, 2023					
ix	Brief description on hydrology and water assessment as per the approved Pre-DPR:	:	Tarali project is a pumped storage project and hence no consumptive use of water has been envisaged for power generation except some water losses due evaporation and seepage. The upper reservoir initial filling up to MDDL can be done within 2 years from existing lower reservoir water; also remaining reservoir filling will be done from existing lower reservoir. The water lost due to evaporation in upper reservoir will also be replenished from existing lower reservoir. The water to be recycled daily between upper and lower reservoirs will be used from existing lower reservoir. Thus, water requirement for the upper reservoir initial filling up to MDDL (one-time) is about 0.94 Mm^3 and water required from the existing lower reservoir for operation of PSP is 10.42 Mm^3. The annual water requirement for recuperating losses in upper reservoir storage due to evaporation, transit etc. has been estimated to be about 0.46 Mm.					
x	Additional detail (If any)	:						
10	**COURT CASE DETAILS**							
i	Court Case	:	No					

S. No.	Component of EMP	Capital Cost	Recurring Cost (Rs. in lakh)					Total Cost
		(Rs. in lakh)	Year 1	Year 2	Year 3	Year 4	Year 5	(Rs. in lakh)

ii	Additional information (if any)	:	-
11	**STATUS OF OTHER STATUTORY CLEARANCES**		
S.No	**Particulars**	:	**Letter no. and date**
i	Status of Stage- I FC	:	The total land requirement for Tarali Pumped Storage Project works out to approximately **150.74 ha**. Entire land is non-forest land and diversion of forest land is not involved. Therefore, forest clearance is not applicable.
ii	Approval of Central Water Commission	:	Hydrology chapter of Tarali PSP has been approved by the CWC vide File No. T-11031/2/2023-HYD(S) DTE dated 04.12.2023.
iii	Approval of Central Electricity Authority	:	Pre-DPR Chapter on Power Evacuation system of Tarali PSP is approved by CEA vide File No. CEA-PS-11-23(23)/1/2024-PSPA-I Division
iv	Additional detail (If any)	:	
v	Is FRA (2006) done for FC-I	:	
12	**DETAILS OF THE EMP**		

	1	Catchment Area Treatment Plan	1.15	0.00	0.00	0.00	0.00	0.00	**1.15**
	2	Compensatory Afforest	0.00	0.00	0.0	0.0	0.00	0.	**0.**

	S. No.	Component of EMP	Capital Cost	Recurring Cost (Rs. in lakh)					Total Cost
			(Rs. in lakh)	Year 1	Year 2	Year 3	Year 4	Year 5	(Rs. in lakh)
		ation and NPV*			0	0		00	**00**
	3	Biodiversity Conservation & Wildlife Conservation Plan	966.15	0.00	0.00	0.00	0.00	0.000	**966.51**
	4	Fisheries Development Plan	89.00	0.00	0.00	0.00	0.00	0.000	**89.00**
	5	Muck Dumping and Management Plan	100.00	320.25	282.50	540.50	465.50	0.000	**1708.75**
	6	Landscaping, Restoration of Construction Sites	20.00	86.34	95.60	85.40	60.50	0.000	**347.84**
	7	Sanitation and Solid Waste Management Plan	167.00	34.00	34.00	30.00	0.00	5.000	**270.00**
	8	Public Health Delivery System	60.00	54.50	54.50	54.00	0.00	0.000	**223.00**
	9	Energy Conservation Measures	40.00	61.00	61.00	61.00	0.00	0.000	**223.00**
	10	Labour Management Plan	15.00	17.50	17.50	17.00	0.00	0.000	**67.00**
	11	Green Belt Development Plan	2.40	1.00	5.00	12.00	7.00	4.29	**31.69**

	S. No.	Component of EMP	Capital Cost	Recurring Cost (Rs. in lakh)				Total Cost
			(Rs. in lakh)	Year 1	Year 2	Year 3	Year 4	Year 5	(Rs. in lakh)
	12	Pollution Mitigation Measures	0.00	15.00	15.00	15.00	0.00	0.00	**45.00**
	13	Environmental Monitoring Program	0.00	38.77	38.77	38.78	0.00	0.00	**116.32**
	14	Rehabilitation and Resettlement Plan**	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**
	15	Local Area Development Plan	2124.12	0.00	0.00	0.00	0.00	0.00	**2124.12**
	16	Disaster Management Plan	275.00	42.00	41.50	41.50	0.00	0.00	**400.00**
	17	Watershed Development Plan	74.26	0.00	0.00	0.00	0.00	0.00	**74.26**
		Total	**3934.08**	**670.36**	**645.37**	**895.18**	**533.00**	**9.29**	**6687.28**
	* Diversion of forest land is not required for the proposed project. **150.74 ha of non-forest land identified for the proposed project will be purchased directly from respective landowners through negotiations on a mutually agreed term.								

3.1.3. Deliberations by the committee in previous meetings

N/A

3.1.4. Deliberations by the EAC in current meetings

21.1.3 The EAC during deliberations noted the following:

The EAC deliberated on the information submitted and presented during the meeting, observing that the proposal is for the grant of Environmental Clearance (EC) to the project for Tarali Open Loop Pumped Storage Project (1500 MW) in an area of 150.74 Ha located at Village Nivade, Tondoshi, Kalambe and Jalu, Sub District Patan, District Satara, Maharashtra by M/s Adani Green Energy Limited.

The project is listed under S.N.1(c) of the Schedule to the Environmental Impact Assessment (EIA) Notification as a Category 'A' project, which requires appraisal at the Central level by the Expert Appraisal Committee (EAC).

The EAC, constituted under the provisions of the EIA Notification, 2006, and comprising expert members/domain experts in various fields, examined the proposal submitted by the Project Proponent, including the EIA/EMP reports prepared and submitted by the Consultant accredited by QCI/NABET on behalf of the Project Proponent.

The EAC noted that the Project Proponent has provided an undertaking affirming that the data and information provided in the application and enclosures are accurate to the best of their knowledge, with no suppression of information in the EIA/EMP reports. The proponent also acknowledged that if any part of the data/information submitted is found to be false or misleading at any stage, the project will be rejected, and any Environmental Clearance granted will be revoked at the risk and cost of the Project Proponent.

The EAC noted that the Terms of Reference (ToRs) were issued by the Ministry via letter no. J-12011/14/2022-IA. I(R) dated 9.11.2022. The ToR was accorded by Ministry of Environment Forests and Climate Change (MoEF&CC), Government of India vide. Subsequently, due to change in location and configuration of project components; amendment in ToR for 1500 MW installed capacity issued on 3.01.2024.The EAC observed that the baseline data for the EIA/EMP studies was collected in January 2023 to May 2023.

The total land required for the project is 150.74 ha out of which none is a Forest Land and 150.74 ha is Non-forest Land. Therefore, there is no requirement of forest clearance. In case tree falling is required in the region the EAC opined that PP shall obtain necessary clearance/permission from the forest department.

The EAC deliberated on the issues raised by the General Public and response/commitments made by the PP as mentioned in the Public Hearing Report. The Public hearing was chaired by the Upper District Magistrate, Satara, Maharashtra. It was also noted that several representations were received against the project and accordingly it was recommended by the EAC during its previous meeting (28th meeting held on 19.12.2024) to forward the representations received to the PP to provide appropriate response. The PP vide email dated 30.12.2024 has submitted the response to the representations received. The EAC after detailed deliberations observed that the response given by the PP to the issues raised by the general Public are satisfactory. The EAC suggested to implement the commitments made during public hearing in a time bound manner. A detailed action plan be submitted before RO in this regard within 6 months.

The EAC also examined the watershed management plan and observed that it needs revision in activities/budget proposed for watershed development and management in an effective manner. The PP submitted the revised watershed management plan on the same day through email. The EAC found it satisfactory and suggested that the location of the construction of Check Dam, Contour Trench, Farm Ponds, Percolation ponds etc. shall be demarcated on the watershed map delineated during the study and submitted to the RO for effective monitoring of the progress of implementation of watershed development within 10 km radius of the project site.

The EAC observed that Hydrology chapter of Tarali PSP has been approved by the CWC vide File No. T-11031/2/2023-HYD(S) DTE dated 04.12.2023 and Pre-DPR Chapter on Power Evacuation system of Tarali PSP is approved by CEA vide File No. CEA-PS-11-23(23)/1/2024-PSPA-I Division.

21.1.4 The EAC after examining the information submitted and detailed deliberations recommended the proposal for grant of prior Environmental Clearance by the Ministry to Tarali Open Loop Pumped Storage Project (1500 MW) in an area of 150.74 Ha located at Village Nivade, Tondoshi, Kalambe and

Jalu, Sub District Patan, District Satara, Maharashtra by M/s Adani Green Energy Limited, under the provisions of EIA Notification, 2006 and as amended with subject to compliance of applicable Standard EC conditions with the following specific environmental safeguard conditions:

3.1.5. Recommendation of EAC

Recommended

3.1.6. Details of Environment Conditions

3.1.6.1. Specific

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.	The conditions mentioned in the Western Ghats notification (draft notification no. S.O.3060(E) dated 31.07.2024) for development of hydro-power projects issued by the MOEF&CC shall be complied with.
3.	Bio-Gas plant shall be installed in the Project affected area for Utilizing Cattle waste (Cow Dung) into renewable source of fuel.
4.	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.
5.	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.
6.	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.
Socio-economic	
1.	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.
2.	RO plant shall be installed in the nearby 5 villages and the maintenance shall be done by the project Authorities.
3.	Solar panel be provided to the families living in rural areas within 10 km radius of project.
4.	School up to 12^{th} Standard shall be established and managed to provide free quality education for children from project affected villages/Tribal villages.
5.	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.
6.	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
7.	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/local population.
8.	The area is ecologically fragile therefore Project Proponent shall ensure that safety measures as mentioned in the EMP shall be fully implemented.
Disaster Management:	
1.	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.
2.	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.
3.	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.
4.	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.
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 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.
3.	The contract clause limiting the No. of vehicles used during excavation and transportation shall followed scrupulously and the same shall informed to the ministry.
4.	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.
5.	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.
6.	10000 plants shall be planted around the muck disposal area and the survival of plants shall be submitted with the 6 monthly compliance report.

7.	Plantation of saplings shall be carried out as a part of the tree plantation campaign "Ek Ped Ma Ke Naam" and the details of the same shall be uploaded in the MeriLiFE Portal (https://merilife.nic.in).
8.	Watershed development plan prepared in consultation with ICAR/expert Govt. institute 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.

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

Warasgaon Warangi PSP by **ADANI GREEN ENERGY LIMITED** located at **PUNE,MAHARASHTRA**			
Proposal For		Fresh ToR	
Proposal No	**File No**	**Submission Date**	**Activity (Schedule Item)**
IA/MH/RIV/515161/2024	J-12011/19/2022-IA.I (R)	20/12/2024	River Valley/Irrigation projects (1(c))

3.2.2. Project Salient Features

21.2.1: The proposal is for grant of Terms of References (ToR) to the project for Warsgaon Warangi Close Loop Pumped Storage Project (1500 MW) in an area of 226.16 Ha located at Village Khanu, Teckpole and Warangi, Sub District Velhe and Mahad, District Pune and Raigad, Maharashtra by M/s Adani Green Energy Limited.

21.2.2 The Project Proponent and the accredited Consultant R. S. Envirolinks Technologies Pvt. Ltd., made a detailed presentation on the salient features of the project and informed that:

i. Warasgaon Warangi Pumped Storage Project is an Off-stream Closed Loop pumped storage scheme with an installed capacity of 1500 MW (4x300 MW + 2x150 MW). Project is located in Pune and Raigad district of Maharashtra.

ii. The upper and lower dams for the project are proposed to be newly constructed. It is proposed to utilize the 552.83m head available between upper dam proposed across a minor nallah draining into Ambi river and lower dam proposed across a nallah draining into Kal River. The upper dam is located on a rocky ridge near Teckpole village in Velhe Taluka, Pune district of Maharashtra. Whereas the lower dam is located

on a rocky ridge near Warangi village in Mahad Taluka, Raigad district of Maharashtra.

iii. The scheme of operation considered for the project is daily regulation to meet the demand of about 6.41 hours of peak power daily. Off-peak pumping hours are considered as 7.43 hours daily.

iv. Water will be sourced from Kal River for initial filling and annual recuperation of losses. Water requirement for the initial filling of the reservoirs (onetime) is about 13.1 Mm3, which includes losses from upper and lower reservoir. The annual water requirement for recuperating losses in upper & lower reservoir storage due to evaporation, transit and seepage is estimated to be 1.26 Mm3.

v. **PROJECT BACKGROUND:**

- Initially, TOR was issued by MoEF&CC vide its letter dated 13/02/2023 for the installed capacity of 1200 MW.
- After TOR, during survey and investigation and in the process of obtaining various approvals from authorities, there were changes in the project parameters, requiring TOR amendment.
- The proposal for TOR amendment was submitted to MOEF&CC and the same was discussed in 16th meeting of EAC dated 27/09/2024.
- Following changes were proposed:
  - Minor change in locations of the upper reservoir
  - Change in installed capacity from 1200MW (5x240MW) to 1500MW (4x300MW+ 2x150MW)
  - Change in land requirement from 168.95 ha to 226.16 ha
  - Change in forest land requirement from 24.50 ha to 90.0 ha
- The EAC returned the proposal in the present form and made following recommendations:
  - The project proposes to use water of the catchment of lower reservoir for initial filling and annual recuperation of losses. This will impact several small rivulets draining into these reservoirs as the water will not be released downstream.
  - The EAC was of the view that PP has changed configuration of the project drastically which could attract more impact on the environment. The EAC raised its concerns about change in the total forest land required for the project with increase of more than three times i.e. from 24.50 Ha to 88.98 Ha.
  - The EAC also noted that the PP has not applied for Stage-I forest clearance as per time period given as per OM dated 01.08.2013, which stipulates for submission of application for Stage-I Forest Clearance within 6 months of grant of TOR.
  - Accordingly, the EAC suggested the PP to submit a fresh proposal for grant of TOR with modified PFR.
- In line with the EAC's recommendations the revised proposal has been submitted.

vi. Upper dam is located on a rocky ridge near Teckpole village in Velhe Taluka, Pune district of Maharashtra state having a geographical latitude 18°18'44.3374"N and longitude 73°28'8.8284"E. The catchment area up to upper dam site is estimated to be about 7.4 km2. Lower dam is located on a rocky ridge near Warangi village in Mahad Taluka, Raigad district of Maharashtra state having a geographical latitude 18°16'7.2444"N and longitude 73°27' 50.3928"E. The catchment area up to the existing lower dam is about 14.7 km2.

vii. The total land required for the construction of various components and related works for Warasgaon Warangi PSP is estimated to be around 226.16 ha, out of which 136.16ha is non-forest land and 90.00ha is forest land. Diversion of forest land for non-forest purpose will be involved for construction of Warasgaon Warangi project components. Therefore, Forest Clearance is required to be obtained under Forest Conservation Act. Distance from nearest protected area (Tamhini WLS) is 9.50km, however, proposed project is outside the notified ESZ boundary of the sanctuary.

viii. The estimated project cost is Rs. 5516.8 Crores including IDC. As a preliminary estimate, a construction period of 4 years (48 months) from the date of award of civil works package has been estimated for this

project.

ix. **Environmental Sensitive area:**

ESZ of Tamhini WLS is notified on 25/02/2021 as 100m to 3.5km around the boundary. ESZ boundary is 9.2km so wildlife clearance is not applicable. All the components of Warasgaon Warangi PSP are located within the proposed Western Ghats ESA, Maharashtra as per MOEF&CC draft notification no. S.O.30609(E) dated July 31, 2024.

x. Alternative Studies:

Total four (4) alternatives are studied in this selected Valley no. 4, which are compared. Among these four alternatives, alternative-1 was finalised during PFR studies (based on which earlier TOR was issued) and other three alternatives are formulated during later DPR studies.

The details are as under:

S. No.	Item	Alt-1	Alt-2	Alt-3	Alt-4
1	Upper Reservoir location	UR-1	UR-1	UR-2	UR-2
2	Upper Reservoir				
a	Dam Type	Concrete Gravity			
b	Dam length/Height (m/m)	451.3/71.0	451.3/71.0	315.0/56.0	315.0/56.0
3	Upper Intake	1 nos. Horizontal Type, 4 Bays 8.5m wide each	1 nos. Horizontal Type, 4 Bays 8.5m wide each	1 nos. Horizontal Type, 4 Bays 8.5m wide each	1 nos. Horizontal Type, 4 Bays 8.5m wide each
4	HRT, Nos./Dia./Length (m/m)	1/10.0/1696.7	1/10.0/1696.7	1/10.0/1651.6	1/10.0/2020.0
5	Surge Shaft, Dia./Height (m/m)	15.0/86.0	15.0/86.0	15.0/66.0	15.0/66.0
6	Pressure Shaft (PS)				
	Main, Dia./Length (m)	7.5/123.0	7.5/123.0	7.51/109.5	7.5/62.5
	Intermediate, Dia./ Length (m)	5.9/781.0	5.9/781.0	5.9/1789.5	5.9/772.0
	Unit, Dia./Length (m)	3.4/576.0	3.4/374.0	3.4/675.0	3.4/374.0
	Total PS length, (m)	1480.0	1278.0	2574.0	1208.5

7	Powerhouse type	Surface	Underground	Surface	Underground
	Size, LxBxH, (m)	187.0m x 21 m x 34m	187.0m x 21 m x 34m	187.0m x 21 m x 34m	187.0m x 21m x 34 m
8	Tail Race Tunnel				
	Main, nos/Dia./Length, (m)	5nos./4.5/146.0	1/10.0/653.0	5 nos./ 4.5/146.0	1/10.0/653.0
	Intermediate, Dia./ Length, (m)	-	2nos/7.7/90.5	-	2nos/7.7/90.5
	Unit, Dia./Length, (m)	-	5nos./4.5/126.5	-	5nos./4.5/126.5
	Total TRT length, (m)	146.0	870.0	146.0	870.0
	Total WCS length, (m)	3322.7	3844.7	4371.7	4098.5
9	L/H Ratio	5.82	6.68	7.97	7.41
10	Downstream Gate chamber	No	Yes	No	Yes
	Height, (m)	-	83.2	-	83.2
11	Lower Intake	5 nos. Horizontal Type, 2 Bays 6.75m wide each	1 nos. Horizontal Type, 4 Bays 8.0m wide each	5 nos. Horizontal Type, 2 Bays 6.75m wide each	1 nos. Horizontal Type, 4 Bays 8.0m wide each
12	Dam Type	Earth Core Rockfill Dam	Earth Core Rockfill Dam	Earth Core Rockfill Dam	Earth Core Rockfill Dam
13	Dam length/Height (m)	813.1/51.5	813.1/51.5	813.1/51.5	813.1/51.5
14	Storage Available for Generation UR (MCM)	7.61	7.61	7.10	7.10
15	Storage Available for Generation LR (MCM)	7.30	7.30	7.29	7.29
16	Rated Net head, Gen/Pump, m	570.98/ 601.33	575.13/598.53	548.73/ 577.83	552.83/ 575.03

17	Rated Discharge Gen./Pumping, cumec	320.45/ 274.78	318.13/ 276.07	312.6/ 268.08	310.28/ 269.39
18	Annual Energy Generation, MU	3532.23	3559.97	3298.46	3320.13
19	Daily generation Hours	6.37	6.42	6.34	6.38
20	Cycle Efficiency, %	78.04	78.92	78.05	78.95
21	**INSTALLED CAPACITY (MW)**	**1200**	**1600**	**1500**	**1500**

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

1	**PROJECT DETAILS**				
i	Name of the Proposal	:	Waragaon Warangi Pumped Storage Project (1500MW)		
ii	Location (including coordinates)	:	**Reservoir**	**Latitude**	**Longitude**
			Lower Reservoir	18°16'7.2444"N	73°27'50.3928"E
			Upper Reservoir	18°18'44.3374"N	73°28'8.8284"E
iii	Interstate Issue	:	No		
iv	Seismic Zone	:	Zone-III		
2	**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		
3	**ELECTRICITY GENERATION AND CAPACITY**				

i	Powerhouse Installed Capacity	:	1500 MW
ii	Generation of Electricity Annually	:	3335.74 MU
iii	No. of Units	:	6 nos. (4X300 MW+2X150 MW)
4.	**Additional information (if any)**	**:**	**Nil**
5	**TOR/EC DETAILS**		
i	Cost of project	:	INR 5516.8 crore
ii	Total area of Project	:	226.16 ha
iii	Height of Dam from Riverbed (EL)	:	Lower Dam – 51.50 m Upper Dam – 56.0 m
iv	Length of Tunnel/Channel	:	1970.0 m
v	Details of Submergence area	:	144.30 ha
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)
vii	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)	:	20.0ha Non-Forest 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	:	136.16ha
ii	Government land/Forest Land	:	90.0ha
iii	Submergence area/Reservoir area	:	144.30ha
iv	Land required for project components	:	81.86ha
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 (Tamhini WLS) is 9.50 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**		

12	**MISCELLANEOUS**		
	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)
	Address	:	403, Bestech Chambers, Block-B, Sushant Lok Phase I, Sector 43, Gurugram, Haryana – 122009
	Email	:	ravi@rstechnologies.co.in
ii	Project Benefits	:	
			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.
iii	Status of other statutory clearances	:	Online application seeking forest diversion for around 90.0 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
iv	R&R Details	:	Details shall be evaluated during EIA/EMP Studies
v	Additional Details 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

21.2.3 The EAC during deliberations noted the following:

The EAC deliberated on the information submitted (Form 1, PFR, kml file, etc.) and as presented in the meeting and observed that the proposal is for grant of TOR to the project for conducting EIA/EMP and Public hearing for Warsgaon Warangi Close Loop Pumped Storage Project (1500 MW) in an area of 226.16 Ha located at Village Khanu, Teckpole and Warangi, Sub District Velhe and Mahad, District Pune and Raigad, Maharashtra by M/s Adani Green Energy Limited.

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

The total land requirement for the project is around 226.16 ha, out of which 136.16ha is non-forest land and 90.00ha is forest land, Distance from nearest protected area (Tamhini WLS) is 9.50km, however, proposed project is outside the notified ESZ boundary of the sanctuary

Additionally, the Project Proponent has submitted a Memorandum of Understanding (MoU) dated 03.09.2024, signed between the Department of Water Resources, Government of Maharashtra and M/s Adani Green Energy Limited., granting in-principle approval for the establishment of the Pumped Storage Project with a capacity of 1500 MW in District Satara.

The EAC noted that earlier ToR was granted by the MoEF&CC vide its letter dated 13/02/2023 for the installed capacity of 1200 MW. Afterwards, PP submitted the proposal for amendment in ToR for change in change in locations of the upper reservoir, change in installed capacity from 1200MW (5x240MW) to 1500MW (4x300MW+ 2x150MW), change in land requirement from 168.95 ha to 226.16 ha including huge change in change in forest land requirement from 24.50 ha to 90.0 ha. The EAC in its meeting held on 16th meeting of EAC dated 27/09/2024 returned the proposal in the present form and asked PP to obtained fresh Terms of Reference from the Ministry.

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

The EAC noted that Upper dam proposed across a small stream draining into Ambi river which is a non-perennial river stream, therefore the project cannot be treated as close loop project and it will treated as open loop project. The EAC opined that PP shall make provisions in the project design to release self-catchment water in the downstream of Ambi river in monsoon season, as the water source of the project is the Tarali Lake which is proposed to be used as lower reservoir. The hydrological data certified by the CWC/State Water Resource Department, of water that is received by the small stream on which upper reservoir shall be constructed, be submitted. The PP will submit a monitoring mechanism for releasing the self -catchment water of small streams along with action plan for conservation and protection of other streams/rivulets within 10 km radius of the project.

21.2.4 The EAC based on the information submitted and as presented during the meeting, recommended the proposal for grant of Specific ToR issued by the Ministry for Open Loop Pumped Storage Projects vide OM dated 14.08.2023 for conducting EIA study for proposed construction of the project for Warsgaon Warangi Open Loop Pumped Storage Project (1500 MW) in an area of 226.16 Ha located at Village Khanu, Teckpole and Warangi, Sub District Velhe and Mahad, District Pune and Raigad, Maharashtra by M/s Adani Green Energy Limited, under the provisions of EIA Notification, 2006, as amended along with the following additional/specific ToR

3.2.5. Recommendation of EAC

Recommended

3.2.6. Details of Terms of Reference

3.2.6.1. Specific

Miscellaneous	
1.	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 submitted.
5.	Undertaking need to be submitted on affidavit stating that no activities has been started on the project site.
6.	Detailed plan to restore wider roads and convert them into narrow up to 10m after construction of the project.
7.	Specific Terms of Reference (ToRs) issued by the Ministry vide Office Memorandum No. F. No. IA3-22/33/2022-IA.III dated 14.08.2023 for Pumped storage projects shall be used for preparation of EIA/ EMP reports.
8.	As per Ministry's OM dated 1st August, 2013, PP shall submit application to obtain prior approval of Central Government under the Forest Conservation Act, 1980 for diversion of forest land required for such projects will be submitted as soon as the actual extent of forest land required for the project is known to the project proponent, and in any case, within 6 months of issuance of ToR. However, no proposal will be put up before EAC without submission of application for forest clearance, wherever applicable.
9.	The conditions mentioned in the Western Ghats notification (draft notification no. S.O.3060(E) dated 31.07.2024) for development of hydro-power projects issued by the MOEF&CC shall be complied with while preparing EIA/EMP report.
Disaster Management	
1.	Impact of Project activities (specially blasting and drilling) on the aquatic and terrestrial ecosystem, within study area to be studied and be incorporated in EIA/EMP report.
2.	The muck dumping sites shall be located with a distance of 100 mts from HFL. The PP shall submit the detailed action plan for transportation of muck along with monitoring mechanism of movement of muck carrying trucks.
Muck Management/ 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.
Socio-economic Study	
1.	Declaration by the project proponent by way of affidavit that "No" Inter-state issue/ policy issue is involved with any State in the project.
2.	All the tasks including conducting public hearing shall be done as per the provisions of EIA Notification, 2006 and as amended from time to time. A comparative chart of issues raised by General Public during Public Hearing and commitments made by the Project Proponent will be prepared and submitted in the relevant chapter of EIA/EMP report.
3.	PP shall submit the credible documents to show the status of land acquisition w.r.t project site from/through the concerned State Government as required under Ministry's OM dated 7th October, 2014 for the project land to be acquired.
4.	Land acquired for the project shall be suitably compensated in accordance with the law of the land with the prevailing guidelines. Private land (if any) shall be acquired as per provisions of Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013. Budget earmarked for R&R, CSR shall not be included in the cost of EMP.
Environmental Management and Biodiversity Conservation:	
1.	The PP will submit 10 years water availability data certified by the CWC/State Water Resource Department for quantity of water that is received annually by the small stream on which upper reservoir is proposed to be constructed.
2.	The PP will submit a monitoring mechanism for releasing the self -catchment water of small stream draining in to upper reservoir of the project along with action plan for conservation and protection of other streams/rivulets draining in to upper and lower reservoirs.
3.	Detailed action plan for large scale plantation of native species of plant sapling within 10 km radius of the project shall be prepared in consultation with State Forest Department. The monitoring mechanism to ensure the survival of saplings shall be finalised in consultation with ICFRE.
4.	Explore the possibilities for reducing the Forest land requirement. The application for obtaining Stage I FC for 90 Ha of forest land involved in the project shall be submitted within stipulated time.
5.	Muck disposal site and other components such as Township, site office, Stacking area and batching plant shall be located outside the forest area.
6.	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.
7.	PP shall submit the detailed plan for filling the reservoir for generating additional power by PSP other than currently operational plant.
8.	Transportation Plan for transporting construction materials shall be submitted. Separate chapter for risk assessment of such transportation through/within proposed the Wildlife Sanctuary shall be

	included in the EIA report.
9.	Environmental Cost Benefit Analysis shall be done in terms of loss of Forest ecosystem due to diversion of Forest land/loss of biodiversity, water availability, water uses for generation of hydro power and Ecological flows.
10.	The baseline data collection will cover the changes in biological and ecological profile of the region after monsoon with worst-case scenario study and critical mineral assessment.
11.	Calculation and values of GHGs (CO2, CH4 etc.) emissions during construction and during operation till the life of the project shall be estimated and submitted.
12.	The longitudinal connectivity/Free flowing sketch be provided in the EIA/EMP report. Presence of any critical mineral zone in the proposed area be clarified from GSI
13.	Quantitative values of Impact modelling of environmental parameters shall be submitted for during construction and operation. Also, mitigation measures shall be submitted in terms of construction and operation phase.
14.	Conducting site-specific ecological study emphasizing on riverine ecology viz. fishes diversity, fish migration, habitat and aquatic biota due to construction PSP. Impact assessment on the fish diversity based on the hydrological alteration at the water drawing sources shall be studied.
15.	Cumulative Impact of projects in the basin on carrying capacity and sustainability of Reservoir/ River /nala of catchment area due to tapping of water for filling reservoir shall be studied.
16.	Action plan for survival or diversion of the rivulets/stream, if any, leading to join river shall be submitted.
17.	Impact zone decided prior to base line data generation and accordingly, sampling location shall be finalized. Baseline data as mentioned in Specific ToR shall be collected for preparation of EIA/ EMP report along with soil characteristics which shall be studied at minimum 10 locations. The ground water level at 10 locations shall be measured in project area in all three seasons.
18.	A study shall be carried out on impact of project activity on the aquatic and terrestrial ecosystem, within project area classifying the impact zones (highly impact/low impact zone) based on seasonal variations and covering the aspects related to impacts on aquatic ecosystem/ primary productivity due to quantity of water to be lifted for power generation and thermal stratification. Accordingly, Environment Management plan shall be prepared.
19.	Reservoir/ River banks protection plan all along the submergence need to be prepared and incorporated in EIA/ EMP.
20.	Scope of watershed development in the 10 km radius of the project shall be studied in consultation with Indian Council of Agriculture Research (ICAR) Institutes/ Expert Govt. institutions and accordingly a detailed Water Shed Development Plan shall be prepared and incorporated in EIA/ EMP report.
21.	Details of mineral zone, if any, in the study area, certified by Geological Survey of India or any other concerned Government Organization shall be submitted.The project area should not come up on any critical mineral zone, the same shall to be verified by GSI/NMDC.
22.	Any archaeological sites in the vicinity of the project, if any, then it shall be certified by ASI.

23.	A Sub-committee comprising members from EAC shall visit the site before considering the proposal for EC in view of the location of project located in Western Ghats.

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.
3	Sedimentation data available with CWC may be used to find out the loss in storage over the years.

0.	
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.

3.3. Agenda Item No 3:

3.3.1. Details of the proposal

CHENTIKHEDA MAJOR IRRIGATION PROJECT by **Dinesh kumar ratnakar** located at **SHEOPUR,MADHYA PRADESH**			
Proposal For		Fresh ToR	
Proposal No	**File No**	**Submission Date**	**Activity (Schedule Item)**
IA/MP/RIV/500241/2024	J-12011/28/2024-IA.I (R)	11/11/2024	River Valley/Irrigation projects (1(c))

3.3.2. Project Salient Features

21.3.1: The proposal is for grant of Terms of References (ToR) to the project for Chentikheda Major Irrigation Project (CCA: 15300 ha) in an area of 1361.25 Ha Located at Villages Agra, Bijaipur, Devra, Garhi and etc., Sub-district Vijaypur and Sabalgarh, District Sheopur and Morena, Madhya Pradesh by M/s Water Resources Department, Government of Madhya Pradesh.

The EAC considered the proposal in 19th meeting held on 19th December, 2024 and defrred the proposal due to PP's lack of adherence to procedural requirements, specifically the failure to circulate the requisite documents to committee members before the scheduled meeting and PP lack of seriousness in presenting their proposal.

21.3.2 The Project Proponent and the accredited Consultant M/s PDCOR Limited, Jaipur, mad a detailed presentation on the salient features of the project and informed that:

S.N.	Type of land	Area	Unit
i	Private Land	709.51	hact
ii	Govt land	587.14	hact
iii	Forest land	64.60	hact
	Total	1361.25	hact
	No of families affected	1264	No
	No of ST families affected	892	no

S No	Parameters	Alternative 1	Alternative 2	Alternative 3 (Proposed
1	Latitude	25°57'28.42"N	25°58'28.01"N	25°58’3.5” N
2	Longitude	77°16'1.38"E	77°17'26.04"E	77°17’2.15" E
3	Appx. Submergence area	789.06 Ha	2049 Ha	1361.25 Ha
5	Capacity and submergence area	Dam capacity is very l ess and not sufficient t o feed required comm and area and if the hei ght of Dam is increase d to meet the water re quirement, then a den sely populated Agar Village will get Subm erged causing increas ed R&R practices.	In terms of co mmand area d am capacity is sufficient but t he dam length requirement c omes out large causing excess ive Submerge nce.	Designed capacity achiev gate required command a reduced in submergence Govt and Pvt land then A e-2.
6	Overhead tank	Suitable location for o verhead tank is not av ailable in the vicinity.	Cost of constr uction of over head tank is hi gh because of depressed gro und level less bearing capaci	Suitable location (hill are erhead tank construction arby making it the most e al site for overhead tank a

			ty soil availabl e in the vicinit y.	
7	Length of Dam	3576 m	5793 m	4329.88 m
8	Command area	As Dam capacity is lo wer than designed cap acity accordingly com mand area needs to re duce	As Dam capac ity is sufficien t to feed the re quired comma nd area	As Dam capacity is suffi eed the required command
9	Technical feasibility	No sufficient water is available to feed requi red command area Not feasible	In this alternat ive submergen ce area (includ ing Forest, Go vt and private land) will incr ease which lea ds high project cost Not feasible	This alternative is technic ible as estimate project co comparable Alternative -1
10	Financial Approval	Not approved by govt.	Not approved by govt.	Approved by govt.

1. Project details:

Name of the Proposal	Chentikheda Major Irrigation Project
Location (Including coordinates)	Lat 25°58’3.5” N and Long 77°17’2.15" E.
Inter- state issue involved	No
Seismic zone	Zone – II

2. Category details:

Category of the project	B1
Provisions	EIA Notification 2006 & amendment
Capacity / Cultural command area (CCA)	15300 Ha
Attracts the General Conditions (Yes/No)	Yes
Additional information (if any)	-

3. ToR /EC Details:

Cost of project	539 Cr
Total area of Project	CCA 15300 Ha

Height of Dam from River Bed (EL)	27.30 m
Length of Tunnel/Channel	381 Km Pipe network proposed (length of main pipeline 38km and distribution 343k m)
Details of Submergence area	1361.25 Ha
Types of Waste and construction/Operation Quantity of generation during	Municipal Solid Waste from labour colony & Excavated Muck
E-Flows for the Project	Provision of environmental release of 0.20 MCM
Is Projects earlier studies in Cumulative Impact asses sment & Carrying Capacity studies (CIA&CC) for R iver 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 riv er ecosystem.	No

4. Muck Management Details:

No. of proposed disposal area/(type of land- F orest/Pvt. land)	Mostly, the wastes from excavation activities wil l be reutilized for land leveling & construction of dam earthen embankment, approach road etc. Th e remaining less quantity of solid waste will be d isposed of at low lying area within project area
Muck Management Plan	Details of Solid waste/ Hazardous waste generati on/ Muck and its management Municipal Solid waste will be estimated 50 TPA and it will be dis posed by authorized vendor. Muck;- Total muck generated 3.69 MCM (After swelling factor 1.3 3) out of this after laying project pipeline 1.98 M CM will be filled back and remaining Muck to b e disposed is 1.71 MCM. As per GAD additional quantity of Muck apart from back filling is used in leveling of low laying area creating access and approach road in non-forest area. It will be prude nt to utilize fertile soil in the command area by d istributing it to nearby farmers.

5. Land Area Breakup:

Private land	709.50 Ha
Government land/Forest Land	651.75 Ha
Submergence area/Reservoir area	1361.25 Ha

Land required for project components	1361.25 Ha including Government land
Additional information (if any)	-

6. 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	64.60 Ha
National Park	Yes	Kuno National Park
Wildlife Sanctuary	Yes	Palpur-Kuno Wildlife Sanctuary

7. Court case details: Nil

8. Miscellaneous

Details of consultant	M/s PDCOR Limited, Jaipur
Project Benefits	On completion of the Project the following benefits can be derived: • 15300 Ha. Agriculture land will be benefited • Rise in sub soil water level in the project area. • Development of fisheries in the reservoir. • Production of crops will increase Hence per capita income will increase • Employment to local labour largely tribes during construction period.
Status of other statutory clearances	Forest clearance is under process
R&R details	R&R yet to be started
Additional detail (If any)	Nil

3.3.3. Deliberations by the committee in previous meetings

Date of EAC 1 :30/11/2024

Deliberations of EAC 1 :

Therefore, EAC decided to ***defer*** the proposal.

3.3.4. Deliberations by the EAC in current meetings

21.3.3 The EAC during deliberations noted the following:

The EAC deliberated on the information submitted (Form 1, PFR, kml file, etc.) and as presented in the meeting and observed that the proposal is for grant of TOR to the project for conducting EIA/EMP and Public hearing for Chentikheda Major Irrigation Project (CCA: 15300 ha) in an area of 1361.25 Ha Located at Villages Agra, Bijaipur, Devra, Garhi and etc., Sub-district Vijaypur and Sabalgarh, District Sheopur and Morena, Madhya Pradesh by M/s Water Resources Department, Government of Madhya

Pradesh.
The EAC noted that the as per the provisions the project comes under "B1" category as it is a major irrigation project because the CCA lies between ≥10,000 ha i.e. 15300 Ha. of CCA for which only EMP is required. However due to presence of Kuno National Park is located within 10 km distance from the project site the project transformed to category 'A' project and will be appraised at central level.
In view of the Kuno National Park is located within 10 km distance from the project boundary the EAC emphasis to prepare detailed wildlife conservation plan including a baseline assessment of biodiversity, habitat quality, and wildlife corridors, along with an impact analysis of the project and mitigation measures, such as creating green buffers, minimizing disturbances, and implementing biodiversity-friendly practices, must be outlined.
The total land requirement for the project is 1361.25 Ha out of which 651.75 Ha is forest land/government land, 709.50 Ha is private land. It was noted that the application for Stage-I Forest Clearance for the diversion of 72.27 ha Forest land was submitted to MoE&FCC vide letter No. FP/MP/HYD/IRRIG/502063/2024, Date 03.11.2024.
19.3.4 The EAC based on the information submitted and as presented during the meeting, **recommended** the proposal for grant of Specific ToR issued by the Ministry for conducting EIA/EMP and Public hearing for Chentikheda Major Irrigation Project (CCA: 15300 ha) in an area of 1361.25 Ha Located at Villages Agra, Bijaipur, Devra, Garhi and etc., Sub-district Vijaypur and Sabalgarh, District Sheopur and Morena, Madhya Pradesh by M/s Water Resources Department, Government of Madhya Pradesh, under the provisions of EIA Notification, 2006, as amended along with the following additional/specific ToR.

3.3.5. Recommendation of EAC

Recommended

3.3.6. Details of Terms of Reference

3.3.6.1. Specific

Miscellaneous.	
1.	Pre-DPR Chapters viz. Hydrology, Layout Map and Power Potential Studies duly approved by CWC/CEA shall be submitted..
2.	Pre-DPR Chapters viz. Hydrology, Layout Map and Power Potential Studies duly approved by CWC/CEA shall be submitted.
3.	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.
4.	Both capital and recurring expenditure under EMP shall be submitted.
5.	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.
6.	Arial view video of project site shall be recorded and to be submitted.
Muck Management/ Disaster Management	

1.	Details of quantity of muck generation component wise and disposal site along with transportation plan and its monitoring to be provided.
2.	Details of Muck Management plan prepared along with estimated cost incorporated in EIA/EMP report.
3.	Techno-economic viability of the project must be recommended from CEA/ CWC.
Socio-economic Study	
1.	Public Health Delivery Plan including the provisions of drinking water supply for local population shall be in the EIA/EMP Report. Status of the existing medical facilities in the project area shall be discussed. Possibilities of strengthening of existing medical facilities, construction of new medical infrastructure etc. will be explored after assessing the need of the labour force and local population.
2.	Declaration by the Project Proponent by way of affidavit that "No" Inter-state issue/ policy issue is involved with any State in the project.
3.	All the tasks including conducting public hearing shall be done as per the provisions of EIA Notification, 2006 and as amended from time to time. Public hearing issues raised and compliance of the same shall be incorporated in the EIA/ EMP report in the relevant chapter.
4.	Statement on the commitments (activity-wise) made during public hearing to facilitate the discussion on the CER in compliance of the Ministry's OM F. No. 22- 65/2017-IA.III dated 30th September, 2020 shall be submitted.
5.	Tentative no. of project affected families shall be identified and accordingly appropriate Rehabilitation & Resettlement plan shall be prepared.
6.	Details of settlement in 10 km area shall be submitted.
7.	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.
Environmental Management and Biodiversity Conservation:	
1.	PP shall obtain NBWL Clearance in view of Kuno National Park is located within 10 km distance from the project boundary.
2.	Explore the possibilities for reducing the Forest land requirement.
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.	The water of rainfall yield of self-catchment of the reservoir shall be released to downstream through body of dam/ barrage/ embankment etc.
5.	Prepare Wildlife conservation plan specifically for avi-fauna with mitigation measures for minimizing the human–animal conflict and be suitably incorporated in the wildlife conservation plan in consultation with reputed government expert institute and State Forest Department.
6.	Prepare Environmental Cost Benefit Analysis in terms of ecological damage due to diversion of

	Forest land/ loss of biodiversity and its impacts on ecosystem, water availability, water uses for generation of hydro power in study area 10 km from periphery of Project components
7.	A study shall be carried out on impact of project activity on the aquatic and terrestrial ecosystem, within project area classifying the impact zones (highly impact/low impact zone) based on seasonal variations and covering the aspects related to impacts on aquatic ecosystem/ primary productivity due to quantity of water to be lifted and thermal stratification. Accordingly, Environment Management plan shall be prepared.
8.	Sampling locations be located to cover villages situated near the reservoir and around boundary of forest area for collection of baseline data and data to be incorporated in EIA/EMP report.
9.	Source of construction material and its distance from the project site along with detailed transportation plan for construction material be elaborated in the EIA EMP report. A detailed reclamation/ restoration plan of quarrying site/sites be incorporated in the EIA/EMP report.
10.	A detailed wildlife conservation plan for Schedule –I species, duly approved by the Chief Wildlife Warden, be submitted.
11.	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.
12.	Reservoir/ River banks protection plan all along the submergence need to be prepared and incorporated in EIA/ EMP.
13.	Detail of rivulets around the project area and action plan for their survival shall be incorporated in EIA/EMP.

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
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.	null
4.	Physical geography, Topography, Regional Geological aspects and structure of the Catchment.
5.	Tectonics, seismicity and history of past earthquakes in the area. A site specific study of the earthquake parameters will be done. The results of the site specific earthquake design shall be sent for approval of the

	NCSDP (National Committee of Seismic Design Parameters, Central water Commission, New Delhi for large dams.
6.	Landslide zone or area prone to landslide existing in the study area should be examined.
7.	Presence of important economic mineral deposit, if any.
8.	Justification for location & execution of the project in relation to structural components (dam /barrage height).
9.	Impact of project on geological environment.
10.	null
11.	Meteorology (viz. Temperature, Relative humidity, wind speed/direction etc.) to be collected from nearest IMD station.
12.	Ambient Air Quality with parameters viz. Suspended Particulate Matter (SPM), Respirable Suspended Particulate Matter (RSPM) i.e. suspended particulate materials < 10 microns, Sulphur dioxide (SO2) and Oxides of Nitrogen (NOX) in the study area at 5-6 Locations.
13.	Existing Noise Levels and traffic density in the study area at 5-6 Locations.
14.	null
15.	Soil classification, physical parameters (viz., texture, Porosity, Bulk Density and water holding capacity) and chemical parameters (viz. pH, electrical conductivity, magnesium, calcium, total alkalinity, chlorides, sodium, potassium, organic carbon, available potassium, available phosphorus, SAR, nitrogen and salinity, etc.) at @ one sample/ha of command area.
16.	null
17.	Generation of thematic maps viz, slope map, drainage map, soil map, land use and land cover map, etc. Based on these, thematic maps, an erosion intensity map should be prepared.
18.	New configuration map to be given in the EIA Report
19.	null
20.	History of the ground water table fluctuation in the study area.
21.	Water Quality for both surface water and ground water for [i] Physical parameters (pH, Temperature, Electrical Conductivity, TSS); [ii] Chemical parameters (Alkalinity, Hardness, BOD, COD, NO3, PO4, Cl, So4, Na, K, Ca, Mg, Silica, Oil & grease, phenolic compounds, residual sodium carbonate);[iii] Bacteriological parameter (MPN, Total coliform); and [iv] Heavy Metals (Pb, As, Hg, Cd, Cr6,Total Cr, Cu, Zn, Fe) at minimum10 Locations, however, the sampling numbers should be increased depending on the command area.
22.	Delineation of sub and micro watersheds, their locations and extent based on the Soil and Land Use Survey of India (SLUSOI), Department of Agriculture, Government of India. Erosion levels in each micro-watershed and prioritization of micro-watershed through Silt Yield Index (SYI) method of SLUSOI.

23.	Hydro-Meteorology of the project viz. precipitation (snowfall, rainfall), temperature, relative humidity, etc. Hydro-meteorological studies in the catchment area should be established along-with real time telemetry and data acquisition system for inflows monitoring.
24.	Run off, discharge, water availability for the project, sedimentation rate, etc.
25.	Basin characteristics
26.	Catastrophic events like cloud bursts and flash floods, if any, should be documented.
27.	For estimation of Sedimentation Rate, direct sampling of river flow is to be done during the EIA study. The study should be conducted for minimum one year. Actual silt flow rate to be expressed in ha-m km2 year-1.
28.	Set up a G&D monitoring station and a few rain gauge stations in the catchment area for collecting data during the investigation.
29.	Flow series, 10 daily with 90%, 75% and 50% dependable years discharges.
30.	Environmental flow release should be 20% of the average of the 4 lean months of 90% dependable year during the lean season and 30% of Monsoon flow during monsoon season. For remaining months, the flow shall be decided by the Committee based on the hydrology and available discharge.
31.	A site specific study on minimum environment flow should be carried
32.	null
33.	null
34.	Characterization of forest types (as per Champion and Seth method) in the study area and extent of each forest type as per the Forest Working Plan.
35.	General vegetation profile and floral diversity covering all groups of flora including Bryophytes, Pteridophytes, Lichens and Orchids. A species wise list may be provided.
36.	Assessment of plant species with respect to dominance, density, frequency, abundance, diversity index, similarity index, importance value index [IVI], Shannon Weiner Index etc. of the species to be provided. Methodology used for calculating various diversity indices along with details of locations of quadrats, size of quadrats etc. to be reported within the study area in different ecosystems.
37.	Existence of National Park, Sanctuary, Biosphere Reserve etc in the study area, if any, should be detailed.
38.	Economically important species like medicinal plants, timber, fuel wood etc.
39.	Details of endemic species found in the project area.
40.	Flora under RET categories should be documented using International Union for the Conservation of Nature and Natural Resources (IUCN) criteria and Botanical Survey of India's Red Data list along with economic

	significance. Species diversity curve for RET species should be given.
41.	Fauna study and inventorisation should be carried out for all groups of animals including reptiles and nocturnal animals in the study area. Their present status along with Schedule of the species.
42.	Information (authenticated) on Avi-fauna and wild life in the study area.
43.	Status of avifauna their resident/migratory/ passage migrants etc.
44.	Documentation of butterflies, if any, found in the area.
45.	Details of endemic species found in the project area.
46.	RET species- voucher specimens should be collected along with GPS readings to facilitate rehabilitation. RET faunal species to be classified as per IUCN Red Data list and as per different schedule of Indian Wildlife (Protection) Act, 1972.
47.	Existence of barriers and corridors, if any, for wild animals.
48.	Compensatory afforestation to compensate the green belt area that will be removed, if any, as part of the proposed project development and loss of biodiversity.
49.	For categorization of sub-catchments into various erosion classes and for the consequent CAT plan, the entire catchment (Indian Portion) is to be considered and not only the directly the draining catc
50.	Documentation of aquatic fauna like macro-invertebrates, zooplankton, phytoplanktons, benthos etc.
51.	Fish and fisheries, their migration and breeding grounds.
52.	Fish diversity, composition and maximum length & weight of the measured populations to be studied for estimation of environmental flow.
53.	Conservation status of aquatic fauna.
54.	Cropping pattern and Horticultural practices in the study area.
55.	Collection of primary data on agricultural activity, crop and their productivity and irrigation facilities component.
56.	Component of pressurized/drip irrigation and micro irrigation.
57.	Details of Conjunctive use of water for irrigation
58.	Collection of Baseline data on human settlements, health status of the community and existing infrastructure facilities for social welfare including sources of livelihood, job opportunities and safety and security of workers

	and surrounding population.
59.	Collection of information with respect to social awareness about the developmental activity in the area and social welfare measures existing and proposed by project proponent.
60.	Collection of information on sensitive habitat of historical, cultural and religious and ecological importance.
61.	The Socio-economic survey/profile within 10 Km of the study area for Demographic profile; Economic Structure; Development Profile; Agricultural Practices; Infrastructure, education facilities; health and sanitation facilities; available communication network etc.
62.	Documentation of Demographic, Ethnographic, Economic structure and development profile of the area
63.	Information on Agricultural practices, Cultural and aesthetic sites, Infrastructure facilities etc
64.	Information on the dependence of the local people on minor forest produce and their cattle grazing rights in the forest land.
65.	List of all the Project Affected Families with their names, education, land holdings, other properties, occupation, source of income, land and other properties to be acquired, etc.
66.	In addition to Socio-economic aspects of the study area, a separate chapter on socio-cultural aspects based upon study on Ethnography of the area should be provided.
Impact Prediction and Mitigation Measures	
1.	The adverse impact due to the proposed project should be assessed and effective mitigation steps to abate these impacts should be described.
2.	Changes in ambient and ground level concentrations due to total emissions from point, line and area sources
3.	Effect on soils, material, vegetation and human health
4.	Impact of emissions from DG sets used for power during the construction, if any, on air environment.
5.	Pollution due to fuel combustions in equipments & vehicles
6.	Fugitive emissions from various sources.
7.	Impact on micro climate
8.	Changes in surface & ground water quality. Steps to develop pisci-culture and recreational facilities.
9.	Changes in hydraulic regime and down stream flow.
10.	Water pollution due to disposal of sewage.
11.	Water pollution from labour colony/camps and washing equipment.
12.	Adverse impact on land stability, catchment of soil erosion, reservoir sedimentation and spring flow (if any) [a] due to considerable road construction/widening activity [b] interference of reservoir with the inflowing streams [c]

	blasting for excavation of canals and some other structures
13.	Changes in land use/land cover and drainage pattern.
14.	Immigration of labour population.
15.	Quarrying operation and muck disposal.
16.	Changes in land quality including effects of waste disposal
17.	River bank and their stability
18.	Impact due to submergence
19.	Impact on forests, flora, fauna including wildlife, migratory avi-fauna, rare and endangered species, medicinal plants etc.
20.	Pressure on existing natural resources
21.	Deforestation and disturbance to wildlife, habitat fragmentation and wild animal's migratory corridors
22.	Compensatory afforestation-Identification of suitable native tree species for compensatory afforestation & green belt.
23.	Impact on fish migration and habitat degradation due to decreased flow of water
24.	Impact on breeding and nesting grounds of animal
25.	Impact on local community including demographic profile.
26.	Impact on socio-economic status.
27.	Impact on economic status.
28.	Impact on human health due to water / vector borne disease.
29.	Impact on increases traffic.
30.	Impact on Holy Places and Tourism.

31.	Impacts of blasting activity during project construction which generally destabilize the land mass and lead to landslides, damage to properties and drying up of natural springs and cause noise pollution, will be studied. Proper record shall be maintained of the base line information in the post project period.
32.	Positive as well as negative impacts likely to be accrued due to the project are to be listed.
Environment Impact Analysis	
1.	Environmental Impact Analysis due to the project on the above mentioned components should be carried out for construction and operation phases using qualitative or quantitative methods.
Environmental Management Plan	
1.	Environmental Management Plan aimed at minimizing the negative impacts of the project should be given in detail. The mitigation measures are to be presented for all the likely adverse impacts on the environment. The following suggestive mitigating plans should be included
2.	Biodiversity and Wild Life Conservation & Management Plan for conservation and preservation of endemic, rare and endangered species of flora and fauna to be prepared in consultation with State Forest Department.
3.	Compensatory Afforestation in lieu of the forest land required for the project needs to be proposed.Choice of plants should be made in consultation with State Forest Department including native and RET species, if any.
4.	Fisheries Conservation & Management Plan-Fish fauna inhabiting the affected stretch of river, a specific fisheries management plan should be prepared for river and reservoir.
5.	Plan for Green Belt Development along the periphery of reservoir, colonies, approach road, canals etc. to be prepared in consultation with the State Forest Department. Local plant species suitable for greenbelt development should be selected.
6.	Environmental Monitoring Programme with physical & financial details covering all the aspects of EMP. A summary of cost estimate for all the plans, cost for implementing all Environmental Management Plans including the cost for implementing environmental monitoring programme should be given. Provision for an Environmental Management Cell should be made.
7.	Catchment Area Treatment (CAT) Plan should be prepared micro-watershed wise. Identification of area for treatment based upon Remote Sensing & GIS methodology and Silt Yield Index (SYI) method of SLUSOI coupled with ground survey. Areas/watersheds falling under 'very severe' and `severe' erosion categories are required to be treated. Both biological and engineering measures should be proposed in consultation with State Forest Department. Year-wise schedule of work and monetary allocation should be provided. CAT plan is to be completed prior to reservoir impoundment. Mitigations measures to check shifting cultivation in the catchment area with provision for alternative and better agricultural practices should be include.
8.	Study of Design Earthquake Parameters: A site specific study of earthquake parameters should be done. The results of the site specific earth quake design parameters should be approval by National Committee of Seismic Design Parameters, Central Water Commission (NCSDP), New Delhi.
9.	Dam Break Analysis and Disaster Management Plan: The outputs of Dam Break Model should be illustrated with appropriate graphs and maps clearly bringing out the impact of Dam break scenario. Provision for early warning systems should be provided.
10.	Reservoir Rim Treatment Plan for stabilization of land slide/land slip zones if any, around the reservoir periphery to be prepared. Suitable engineering and biological measures for treatment of the identified slip zones to be provided with physical and financial schedule.
1	Muck Disposal Plan- suitable sites for dumping of excavated material should be identified in consultation with the

1.	State Pollution Control Board and Forest Department. All Muck disposal sites should be minimum 30 m away from the HFL of river. Plan for rehabilitation of muck disposal sites should also be given. The L- section/ cross section of muck disposal sites and approach roads to be given. Financial out lay for this may be given separately. Deatailed muck transportation plan delinating the path ways, number of trucks, quantity of muck to be transportated along with monitoring mechanism using latest technology, shall be prepared.
12.	Plan for Restoration of quarry sites and landscaping of colony areas, working areas, roads, etc.
13.	Command Area Development (CAD) Plan giving details of implementation schedule with a sample CAD plan.
14.	In the EMP, also include a sample CAD plan for a distributary outlet command. Such a plan is to show the alignment of irrigation and drainage channels. The components of the OFD works to be undertaken may be clearly mentioned along with a time schedule for their completion vis-à-vis the progress of irrigation development.
15.	Mitigating measures for impacts due to Blasting on the structures in the vicinity.
16.	Resettlement and Rehabilitation (R&R) Plan need to be prepared with due consultation with Project Affected Families (PAFs). The provision of the d R&R plan should be according to the National Resettlement and Rehabilitation Policy (NRRP-2007) as well as State Resettlement and Rehabilitation Policy. Detailed budgetary estimates are to be provided. Resettlements sites should be identified.
17.	Public Health Delivery Plan including the provisions for drinking water facility for the local community.
18.	Local Area Development Plan to be formulated in consultation with the Revenue Officials and Village Panchayats. Local skill development schemes should be given. Details of various activities to be undertaken along with its financial out lay should be provided.
19.	Labour Management Plan for their Health and Safety.
20.	Sanitation and Solid Waste Management Plan for domestic waste from colonies and labour camps etc.
21.	Plan for Land Restoration and Landscaping of project sites.
22.	Energy Conservation Measures.
23.	Environmental safeguards during construction activities including Road Construction.
24.	Ground Water Management Plan.
25.	Water and Air Quality & Noise Management Plans to be implemented during construction and post-construction periods.

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 A Johnson	Member (EAC)	jaj@wii.gov.in	
5	Dr J V Tyagi	Member (EAC)	jvt******@gmail.com	
6	Shri Kartik Sapre	Member (EAC)	kar********@gmail.com	Absent
7	Shri Ajay Kumar Lal	Member (EAC)	akl****@gmail.com	
8	Dr A K Sahoo	Member (EAC)	ami***@gmail.com	
9	Shri Rajeev Varshney	Member	rva**********@gov.in	
10	Shri Piyush Ranjan	Member	emo***@nic.in	
11	Yogendra Pal Singh	Scientist E	yog*******@nic.in	

MINUTES OF THE 21ST MEETING (VIRTUAL) OF THE EXPERT APPRAISAL COMMITTEE FOR RIVER VALLEY AND HYDROELECTRIC PROJECTS HELD ON 31ST JANUARY, 2024

The 21st meeting of the EAC for River Valley & Hydro-electric Projects organized by the Ministry of Environment, Forest and Climate Change, Indira Paryavaran Bhawan, Jor Bagh Road, New Delhi, was held on Virtual mode, under the Chairmanship of Prof. G. J. Chakrapani. The list of Members present in the meeting is at **Annexure**.

Confirmation of the Minutes of the 19th EAC meeting:

The Minutes of the Meeting held on 19th EAC meeting on 19th December, 2024 were confirmed.

Agenda Item No. 21.1

Tarali Open Loop Pumped Storage Project (1500 MW) in an area of 150.74 Ha located at Village Nivade, Tondoshi, Kalambe and Jalu, Sub District Patan, District Satara, Maharashtra by M/s Adani Green Energy Limited - Environmental Clearance (EC) - reg.

[Proposal No. IA/MH/RIV/487971/2024; F. No. J-12011/19/2022-IA.I (R)]

21.1.1: The proposal is for grant of Environmental Clearance (EC) to the project for Tarali Open Loop Pumped Storage Project (1500 MW) in an area of 150.74 Ha located at Village Nivade, Tondoshi, Kalambe and Jalu, Sub District Patan, District Satara, Maharashtra by M/s Adani Green Energy Limited.

21.1.2: The Project Proponent and the accredited Consultant R. S. Envirolinks Technologies Pvt. Ltd., made a detailed presentation on the salient features of the project and informed that:

i. The proposed Tarali Pumped Storage Project is envisaged with a proposed installed capacity of 1500 MW (4 x 300 MW + 2 x 150 MW) located in the Satara district of Maharashtra, and is being developed by Adani Green Energy Ltd.

ii. The Tarali Pumped Storage Project will comprise of two reservoirs i.e. Tarali reservoir (already existing) and Upper Reservoir (to be constructed). The project is located in Kalambe, Nivade, Tandoshi and Dafalwadi villages, Patan Taluka of Satara District of Maharashtra. It envisages construction of upper reservoir in Kalambe village in Patan Taluka of Satara District and use the existing Tarali lake as Lower reservoir in Nivade Village of Patan Taluka, Satara District

iii. The geographical co-ordinate of the project are

Upper Dam: Longitude - 73°53'19.97"E

Latitude - 17°30'27.38"N

Lower Dam: Longitude - 73°53'54.11"E

Latitude 17°32'00.14"N

iv. **Land requirement:**

Forest Land	: 0 ha
Non-forest Land	: 150.74 ha
Total Land	: 150.74 Ha

v. The proposed Scheme will involve construction of 61.5 m high dam for creation of Tarali PSP Upper Reservoir with 11.36 MCM (0.40 TMC) gross storage capacity. Both the reservoirs are planned to be interconnected through water conductor system and the reversible generator pump turbine would be installed in the surface/ pit powerhouse. 2 nos. of pressure shaft further bifurcated into 6 nos. of independent Penstock will be taking off from Intake structure provided with Trash rack and Gates located in upper reservoir. Pit type Powerhouse will be located on the downstream of the intake structure and shall be equipped with 6 Vertical Reversible Francis type units composed each of generator/motor and a pump/turbine having generated capacity of Four units of 300 MW each and 2 Units of 150 MW each.

vi. The total design discharge for the proposed scheme is 90.15 m3 /s per turbine during generation and 78.57 m3 /s during pumping with the rated head of 380.43m during generation and 394.33m during pumping mode. The scheme is envisaged to meet the peak demand of about 6.5 hours with an estimated annual energy generation of 3365.48 MU.

vii. The project proposal was considered by the Expert Appraisal Committee (River Valley and Hydropower Projects) in its meetings held on 14.09.2022 recommended for grant of Terms of Reference (ToRs). The ToR was accorded by Ministry of Environment Forests and Climate Change (MoEF&CC), Government of India vide letter no. J-12011/14/2022-IA. I(R) dated 9.11.2022. Due to change in location and configuration of project components; amendment in ToR for 1500 MW installed capacity approved in EAC meeting of 17.10.2023 and TOR amendment letter issued on 3.01.2024.

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

All project components as well as the entire study area fall under Patan and Satara tehsils in Satara district. There are 97 villages in the study area. Out of 97 villages, 75 are in Patan tehsil, and 22 are in Satara tehsil.

The baseline socio-economic profile is based on a field survey and the Census of India 2011. The total population of the study area is 74765 people, with 36357 males (48.62%) and 38408 females (51.37%). There are 16337 households, with an average occupancy of 4 to 5 people per house. The number of children under the age of six was found to be 8786, accounting for 11.75% of the total population. The sex ratio was

found to be 1056 females per 1000 males.

There are 4942 scheduled castes population, accounting for 6.61% of the total population, with 2391 scheduled caste males and 2551 scheduled caste females. There are 543 scheduled tribes in total, accounting for 0.72% of the total population, with 283 scheduled tribe males and 260 scheduled tribe females.

The literacy rate in the study area is 75.37% (above the 6-year-old population), with males and females having rates of 87.10% and 65.10%, respectively, creating a gender gap of 22%.

According to the 2011 census total population of workers in the study area is 36824 (49.25%). Out of the total worker Main and marginal workers were 31459 (85.43%) and 5365 (14.56%) respectively.

Main and marginal workers are classified into four categories: cultivators, agricultural workers, household industry workers, and other workers. As per the 2011 census, out of a total of 36824 workers in the study area, 80.08% of the working population are engaged in agriculture and allied services, out of which 58.80% are cultivators and 21.28% are agricultural labourers. Only a small percentage of the population engaged in household industry 3.42%, and 16.49% of the population engaged in other services, viz., trade, commerce, business, transport, government, and private jobs.

ix. **Water requirement**: The water requirement for the upper reservoir initial filling up to MDDL (one-time) is about 0.94 Mm3 and water required from the existing lower reservoir for operation of PSP is 10.42 Mm3. The annual water requirement for recuperating losses in upper reservoir storage due to evaporation, transit etc. has been estimated to be about 0.46 Mm.

x. **Project Cost**: The estimated project cost is Rs 5675.0 crore. Total capital cost earmarked towards Environment Management Plan/environmental pollution control measures is Rs. 3934.08 lakh and the Recurring cost (operation and maintenance) will be about Rs. 2753.20 lakh.

xi. **Project Benefit:** Total Employment will be 1000 persons as direct & persons indirect after expansion. Industry proposes to allocate Rs. 2124.12 Lakh towards CER (as per Ministry's OM dated 30th Sep 2020).

xii. **Environmental Sensitive area:** No project component falls in any notified protected area. Nearest protected areas to the project components are Sahyadri Tiger Reserve and Koyna Wildlife Sanctuary, which are at the distance of 1.5 km and 3.2 km, respectively. As the Eco-sensitive zones (ESZ) are not notified, project will undergo Wildlife Clearance from National Board of Wildlife (NBWL).

xiii. MOU signed with Maharashtra State Government on 28th June 2022.

xiv. **Resettlement and rehabilitation:** The entire private land identified for the project falls in four revenue villages namely Kalambe, Nivade, Dafalwadi and Tondoshi villages of Patan Taluka of Satara District of Maharashtra. Due to in the proximity of project area and issues raised by villagers during public hearing, Dafalwadi village was also considered as project affected village. The private land identified for the projects belongs to landowner families who will be losing their partial agricultural land holding and none of the families will be losing any house or any other assets. None of them is getting displaced due to the project from the above land procurement.

xv. **Alternative Studies:** Three alternative layouts are studied for Tarali PSP. For these three layouts two alternative locations of upper reservoirs (UR-1 and UR-2) and two alternative locations of powerhouse (PH-1 and PH-2) have been explored, whereas lower reservoir is kept same for all the options. Considering lesser excavation in powerhouse (PH-2) and lesser length of dam, higher storage capacity (UR-2) in reservoir, the Alternative-3 (UR-2 + PH-2 + LR) appears to be preferable than other two Alternatives-1 & 2. Hence, Alternative-3 is considered for further study.

xvi. Baseline Environmental Scenario:

Period: **From January 2023 To May 2023**

AAQ parameters at 10 locations (min. & Max.)

Unit in $\mu g/m^3$

Core	Min	Max	Standards
$PM_{2.5}$	10.30	16.70	60
PM_{10}	25.40	37.50	100
SO_2	4.00	5.20	80
NO_2	4.30	5.50	80
Buffer	**Min**	**Max**	
$PM_{2.5}$	9.30	23.50	60
PM_{10}	25.10	52.90	100
SO_2	3.60	7.30	80
NO_2	3.90	7.80	80

Incremental GLC Level

Criteria Pollutant [PM_{10}, $PM_{2.5}$, SO_2, NO_x, Other parameters specific to the sector (Please specify)]	Unit [$\mu g/m^3$]	Baseline Concentration [A]	Predicted incremental value considering worst case stability class [B]	Total GLC [A]+[B]
Core Zone				
PM10	$\mu g/m^3$	39.0	8.5	47.5
PM2.5	$\mu g/m^3$	13.5	22	35.5
SOx	$\mu g/m^3$	4.6	18	22.6
NOx	$\mu g/m^3$	4.9	25	29.9
Buffer Zone				
PM10	$\mu g/m^3$	39.0	8.5	47.5

	PM2.5	µg/m^3	16.40	6	22.4
	SOx	µg/m^3	5.45	7	12.45
	NOx	µg/m^3	4.85	8	12.85

River water samples (04 samples)

Core Zone

S. No	Parameters	Min	Max	Standards
1	pH	6.8	7.25	8.5
2	Total Dissolved Solids, mg/L	13	45	500
3	Dissolved Oxygen (mg/l)	6.3	8.8	3
4	Chloride (as Cl), mg/L	1.9	12.6	0
5	Total Hardness (as CaCO3), mg/L	10	25.3	200
6	Biological Oxygen Demand (mg/l)	2	2	2
7	Chemical Oxygen Demand (mg/l)	6	6	0
8	Total Coliform (MPN/100 ml)	26	67	50

Buffer Zone

S. No	Parameters	Min	Max	Standards
1	pH	6.7	7.42	8.5
2	Total Dissolved Solids, mg/L	31	70	500
3	Dissolved Oxygen (mg/l)	6.5	7.7	3
4	Chloride (as Cl), mg/L	4.5	7.6	0
5	Total Hardness (as CaCO3), mg/L	16.3	20.9	200
6	Biological Oxygen Demand (mg/l)	2	2	2
7	Chemical Oxygen Demand (mg/l)	6	6	0
8	Total Coliform (MPN/100 ml)	21	55	50

Pond water samples

-

Groundwater water samples quality at 0 location

Core Zone

S. No	Parameters	Min	Max	Standards
1	pH	6.5	7.9	6.5
2	Total Dissolved Solids, mg/L	49	226	500
3	Chloride (as Cl), mg/L	20	64	250
4	Total Hardness (as CaCO3), mg/L	83.7	184.7	200
5	Fluoride	0.05	0.13	1

Buffer Zone

S. No	Parameters	Min	Max	Standards
1	pH	6.5	7.49	6.5
2	Total Dissolved Solids, mg/L	42	281	500
3	Chloride (as Cl), mg/L	15	72	250
4	Total Hardness (as CaCO3), mg/L	90.3	154.4	200
5	Fluoride	0.07	0.36	1

Noise levels Leq (Day & Night) at 10 locations

Noise Level	Zone	Leq Day dB(A)		Leq Night dB(A)		Prescribed Limits	
		From	To	From	To	Day	Night
Core	Residential	46.7	51.1	36.1	39.40	55	45
Buffer	Residential	48.2	54	37.2	41.70	55	45

Soil Quality at 10 Locations

Core Zone

S. No.	Parameters	Min	Max	Prescribed Limits
1	Calcium (mg/kg)	114	272	500
2	Sodium Absorption Ratio	1.3	1.9	10
3	Phosphorus (kg/ha)	6.5	11.6	50
4	Carbon (%)	0.66	0.8	1
5	Salinity (ppt)	0	0	0.01
6	Magnesium (mg/kg)	55	202	500
7	Nitrogen (kg/ha)	230	342	500
8	Potassium (kg/ha)	219	449	500
Buffer Zone				
1	Calcium (mg/kg)	41	157	500
2	Sodium Absorption Ratio	1.1	3.8	10
3	Phosphorus (kg/ha)	7.8	25.7	50
4	Carbon (%)	0.55	0.9	1
5	Salinity (ppt)	0	0	0.01
6	Magnesium (mg/kg)	23	101	500
7	Nitrogen (kg/ha)	180	323	500
8	Potassium (kg/ha)	220	332	500

Flora & Fauna

Schedule-I species observed in the study area:

As per Wildlife Protection Amendment Act, 2022, Sambar Deer, Indian Bison, Four-horned Antelope, Common Leopard, Indian Fox, Jackal, Grey Wolf, Indian Grey Mongoose, Striped Hyena, Sloth Bear, Indian Pangolin, Porcupine, White-eyed Buzzard, Cobra are listed as Schedule I species.

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

- The generated muck will be carried in dumper trucks covered with heavy duty tarpaulin properly tied to the vehicle in accordance with best international practices. All precautionary measures will be followed during the dumping of

muck. All dumpers will be well maintained to avoid any chances of loose soil from being falling during transportation. All routes will be periodically wetted with the help of sprinklers prior to the movement of dumper trucks. Dumping would be avoided during the high-speed wind, so that suspended particulate matters (SPM) level could be maintained. Further, dumping will be avoided during heavy traffic. After the dumping the surface of dumps will be sprayed with water with the help of sprinklers and then compacted.

- Four muck disposal yards has been identified with a total area of 35.0 ha and capacity has been worked as 17,77,530 cum.
- The disposal site was identified taking into consideration availability of suitable area, minimum distance from generation sites.

xviii. Public Hearing for the proposed project has been conducted by the Maharashtra Pollution Control Committee on 12.03.2024 at Satara district, Maharashtra. The meeting was chaired by Resident Deputy Collector & Upper District Magistrate, District Satara. The main issues raised and replies by the user agency during the public hearing are detailed in the Public Hearing report submitted on PARIVESH.

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

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

1	**EAC MEETING DETAILS**				
i	EAC meeting/s	:	21st EAC Meeting		
ii	Date of Meeting/s	:	31.12.2024		
iii	Date of earlier EAC meetings	:	14.09.2022 (TOR) & 17.10.2023 (TOR amendment)		
2	**PROJECT DETAILS**				
i	Name of the Proposal	:	Tarali Open Loop Pumped Storage Project (1500 MW)		
ii	Proposal No.	:	IA/MH/RIV/487971/2024		
iii	Location (including coordinates)	:	Tarali PSP is located near Dangistewadi village, Patan Taluka of Satara District of Maharashtra.		
			Reservoir	**Latitude**	**Longitude**
			Lower Reservoir	17°32'00.14" N	73°53'54.11" E

			Upper Reservoir	17°30'27.38" N	73°53'19.97" E
iv	Company's Name	:	M/s Adani Green Energy Limited		
v	CIN no. of Company/user agency	:	U40106GJ2015PLC082007		
vi	Accredited Consultant and certificate no.	:	NABET/EIA/2225/RA 0274		
vii	Project location (Coordinates /River/ Reservoir)	:	Near Village: Nivade, Tondoshi, Kalambe and Jalu		
viii	Interstate Issue	:	No		
ix	Proposed on River/ Reservoir	:	Tarali Resevoir		
x	Type of Hydro-electric project	:	Pumped Storage Project		
xi	Seismic Zone	:	Zone-IV		
3	**CATEGORY DETAILS**				
i	Category of the project	:	A		
ii	Capacity / ~~Cultural command area (CCA)~~	:	1500MW		
iii	Attracts the General Conditions (Yes/No)	:	Yes		
v	Additional Information if any	:	No		
4	**TOR/EC DETAILS**				
i	ToR Proposal No.	:	IA/MH/RIV/289096/2022		
ii	EAC meeting date	:	14.09.2022 (TOR) & 17.10.2023 (TOR amendment)		
iii	ToR Letter No.	:	J-12011/14/2018-IA-I (R) & J-12011/52/2023-IA-I (R)		
iv	ToR grant Date	:	09.11.2022 (TOR) & 03.01.2024 (TOR amendment)		
v	Cost of project	:	INR 5675.0 Cr		
vi	Total area of Project	:	150.74 Ha		
vii	Height of Dam from River Bed (EL)	:	61.5 m (Upper Dam)		

viii	Details of submergence area	:	51.93 ha
ix	District to provide irrigation facility (if applicable)	:	NA
x	Details of tunnels on upper level & lower level and length of canal (if applicable)	:	
xi	No. of affected Village	:	4
xii	No. of Affected Families	:	325
xiii	Project Benefits	:	**Power Generation**:
			As the Tarali PSP (1500 MW) will come into operation, the electricity generated using the renewable source of energy (i.e. water) is more as compare to the use of fossil fuel. Thus, Air pollution will be much lesser in the given area as the pump storage project get commence. Moreover, while building the project there will be no loss of forest land. For construction of Tarali PSP, no forest land shall be diverted. To develop Greenbelt in the surrounding of project area, plantation over 40.0ha is proposed over restored temporary construction sites and muck dumping area. Watershed development plan has been prepared for soil conservation and management of water resources in the study area with financial provision of **Rs. 38.79 lakh**. A financial provision of **Rs. 20.98 crore** has been allocated for strengthening and development of basic infrastructural facilities with a view to improve the quality of life of residents in the project vicinity. In addition, the project would lead to creation of direct and indirect employment

			opportunities as new factories would come up in and around the project due to reliable power supply/availability, contract works for the locals during construction and operation phase, etc. The project may also increase recreation and tourism potential together with development of infrastructural facilities in the area. All these activities have positive impact on socio-economic environment and will increases the economic status of the people and hence there would be all-round development of the region.
xiv	R&R details	:	The entire private land identified for the project falls in four revenue villages namely Kalambe, Nivade, Dafalwadi and Tondoshi villages of Patan Taluka of Satara District of Maharashtra. Due to in the proximity of project area and issues raised by villagers during public hearing, Dafalwadi village was also considered as project affected village. The private land identified for the projects belongs to landowner families who will be losing their partial agricultural land holding and none of the families will be losing any house or any other assets. None of them is getting displaced due to the project from the above land procurement.
xv	Catchment area/ Command area	:	Catchment Area: 1.18 sq km (Upper Reservoir)
xvi	Types of Waste and quantity of generation during construction/ Operation	:	Municipal Solid Waste- Bio degradable (551.80 Tons), Non degradable (236.52 Tons)
xvii	Material used for blasting and its composition as per DGMS standards.	:	Explosive magazine of adequate capacity would be constructed to store the explosives required for the construction of the project components. It has been assessed that one magazine of 20 MT capacities would be sufficient to meet the requirement of the project. A mobile explosive van shall be deployed to carry explosive at the site of use at upper and powerhouse area. Movement of

			van should be done with armed guards and proper documentation recommended by PESO.
xviii	E-Flows for the Project	:	Proposed PSP is a pumped storage scheme and doesn't involve building any dam/barrage on river Tarali and will not be diverting any water from river Tarali. Only evaporation and transmission losses from upper reservoir of 0.46 Mm3 will be compensated from upper reservoir. Water required for daily generation is 10.42 MCM, the requirement has been adequately reviewed by WRD and water allocation is made without impacting existing users. After analysing the present water utilization catered by Tarali reservoir for drinking and irrigation purposes, Water Resource Department Maharashtra has granted the Industrial Water Entitlement (Bulk Water Entitlement) for Tarali Pumped Storage Project. As the project is not storing/ diverting water of river Tarali, e-flow of water in river Tarali will not be impacted by the project.
xix	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.	:	No

xx	Details on provision of fish pass	:	No
xxi	Project benefit including employment details (no of employee)	:	About 1000 workers (labour and staff) would be engaged during the peak construction period, out of which 250 persons will be engaged permanently and about 750 will be temporary labour for the construction work. It is expected that 70% of the total workforce shall be available from the State of Maharashtra. After completion of the project only a staff of about 200 technical persons shall be required for the operation of the project.
xxii	Area of Compensatory Afforestation (CA) with tentative no of plantation.	:	Since, there is no requirement of any forest land diversion for construction of various components, therefore requirement of preparation of Compensatory Afforestation Plan is not applicable in the present case.
xxiii	Previous EC details	:	-
xiv	EC Compliance Report by R.O, MOEF&CC	:	-
6	**ELECTRICITY GENERATION CAPACITY**		
i	Powerhouse Installed Capacity	:	1500 MW
ii	Generation of Electricity Annually	:	3365.48 MU
iii	No. of Units	:	6 nos. (4 x 300 MW + 2 x 150MW)
6	**MUCK MANAGEMENT DETAILS**		
i	No. of proposed disposal area/ (type of land- Forest/Pvt land)	:	4
ii	Cross section of proposed muck area, Height of muck with slope.	:	Attached as Appendix I
iii	Distance of muck disposal area (location), from muck generation sources (project	:	Muck disposal area from upper reservoir is 750m

	area)/River, HFL of proposed muck disposal area.		Muck disposal area from power house are 650m, 900m and 2500m
iv	Total Muck Disposal Area	:	35.0 ha
v	Estimate Muck to be generated	:	2989569 Cum
vi	Transportation	:	The generated muck will be carried in dumper trucks covered with heavy duty tarpaulin properly tied to the vehicle in accordance with best international practices. All precautionary measures will be followed during the dumping of muck. All dumpers will be well maintained to avoid any chances of loose soil from being falling during transportation. All routes will be periodically wetted with the help of sprinklers prior to the movement of dumper trucks. Dumping would be avoided during the high-speed wind, so that suspended particulate matters (SPM) level could be maintained. Further, dumping will be avoided during heavy traffic. After the dumping the surface of dumps will be sprayed with water with the help of sprinklers and then compacted.
vii	Monitoring mechanism for Muck Disposal Transportation	:	The provisions of Monitoring have been kept under proposed Environmental Monitoring Plan.
7	**LAND AREA BREAK-UP**		
i	Private Land	:	150.74 ha
ii	Forest Land	:	0
iii	Submergence area/Reservoir area	:	51.93 ha
iv	Land required for project components	:	98.81 ha
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/Protected Forest Land	No	No project component falls in any notified protected area. The project components are

ii	National Park	No	proposed outside the buffer zone of Sahyadri Tiger Reserve. The nearest distance of project components from Koyna Wildlife Sanctuary is 3.2 km.
iii	Wildlife Sanctuary	Yes	
iv	Archaeological sites monuments/historical temples etc	No	
v	Additional information (if any)	-	

Availability of Schedule-I species in study area: As per Wildlife Protection Amendment Act, 2022, Sambar Deer, Indian Bison, Four-horned Antelope, Common Leopard, Indian Fox, Jackal, Grey Wolf, Indian Grey Mongoose, Striped Hyena, Sloth Bear, Indian Pangolin, Porcupine, White-eyed Buzzard, Cobra are listed as Schedule I species.

9	**PUBLIC HEARING (PH) DETAILS**		
i	Advertisement for PH with date	:	State level Marathi and English newspaper dated 07.02.2024
ii	Date of PH	:	12.03.2024
iii	Venue	:	Near Gagangiri Maharaj Math at Village Kalambe, taluka Patan, district Satara, Maharashtra
iv	Chaired by	:	Resident Deputy Collector & Upper District Magistrate, District Satara
v	Main issues raised during PH	:	Concerns about Cattle grazing land; The area is vulnerable to landslide and soil erosion; Pazar lake; sewage from the workers colony living here gets mixed with the seepage pond, threatening the health of the village.
vi	No. of people attended	:	150

9	**BRIEF OF BASE LINE ENVIRONMENT**			
i	**Parameters**	:	**Winter**	**Pre-Monsoon/ Summer**
ii	Soil	:	January, 2023	April-May, 2023
iii	Air Environment	:	January-February, 2023	April-May, 2023
iv	Noise & Traffic	:	January, 2023	April-May, 2023
v	Water Quality	:	January, 2023	April-May, 2023
vi	Vegetation	:	January, 2023	April-May, 2023

vii	Fauna surveys	:	January, 2023	April-May, 2023
viii	Socio-economic survey	:	April-May, 2023	
ix	Brief description on hydrology and water assessment as per the approved Pre-DPR:	:	Tarali project is a pumped storage project and hence no consumptive use of water has been envisaged for power generation except some water losses due evaporation and seepage. The upper reservoir initial filling up to MDDL can be done within 2 years from existing lower reservoir water; also remaining reservoir filling will be done from existing lower reservoir. The water lost due to evaporation in upper reservoir will also be replenished from existing lower reservoir. The water to be recycled daily between upper and lower reservoirs will be used from existing lower reservoir. Thus, water requirement for the upper reservoir initial filling up to MDDL (one-time) is about 0.94 Mm^3 and water required from the existing lower reservoir for operation of PSP is 10.42 Mm^3. The annual water requirement for recuperating losses in upper reservoir storage due to evaporation, transit etc. has been estimated to be about 0.46 Mm.	
x	Additional detail (If any)	:		
10	**COURT CASE DETAILS**			
i	Court Case	:	No	
ii	Additional information (if any)	:	-	
11	**STATUS OF OTHER STATUTORY CLEARANCES**			
S.No	**Particulars**	:	**Letter no. and date**	
i	Status of Stage- I FC	:	The total land requirement for Tarali Pumped Storage Project works out to approximately **150.74 ha**. Entire land is non-forest land and diversion of forest land is not involved. Therefore, forest clearance is not applicable.	
ii	Approval of Central Water Commission	:	Hydrology chapter of Tarali PSP has been approved by the CWC vide File No. T-11031/2/2023-HYD(S) DTE dated 04.12.2023.	
iii	Approval of Central Electricity Authority	:	Pre-DPR Chapter on Power Evacuation system of Tarali PSP is approved by CEA	

			vide File No. CEA-PS-11-23(23)/1/2024-PSPA-I Division
iv	Additional detail (If any)	:	
v	Is FRA (2006) done for FC-I	:	
12	**DETAILS OF THE EMP**		

S. No.	**Component of EMP**	**Capital Cost (Rs. in lakh)**	**Recurring Cost (Rs. in lakh)**					**Total Cost (Rs. in lakh)**
			Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	
1	Catchment Area Treatment Plan	1.15	0.00	0.00	0.00	0.00	0.00	**1.15**
2	Compensatory Afforestation and NPV*	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**
3	Biodiversity Conservation & Wildlife Conservation Plan	966.15	0.00	0.00	0.00	0.00	0.00	**966.51**
4	Fisheries Development Plan	89.00	0.00	0.00	0.00	0.00	0.00	**89.00**
5	Muck Dumping and Management Plan	100.00	320.25	282.50	540.50	465.50	0.00	**1708.75**
6	Landscaping, Restoration of Construction Sites	20.00	86.34	95.60	85.40	60.50	0.00	**347.84**
7	Sanitation and Solid Waste Management Plan	167.00	34.00	34.00	30.00	0.00	5.00	**270.00**
8	Public Health Delivery System	60.00	54.50	54.50	54.00	0.00	0.00	**223.00**
9	Energy Conservation Measures	40.00	61.00	61.00	61.00	0.00	0.00	**223.00**
10	Labour Management Plan	15.00	17.50	17.50	17.00	0.00	0.00	**67.00**
11	Green Belt Development Plan	2.40	1.00	5.00	12.00	7.00	4.29	**31.69**
12	Pollution Mitigation Measures	0.00	15.00	15.00	15.00	0.00	0.00	**45.00**
13	Environmental	0.00	38.77	38.77	38.78	0.00	0.00	**116.32**

	Monitoring Program							
14	Rehabilitation and Resettlement Plan**	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**
15	Local Area Development Plan	2124.12	0.00	0.00	0.00	0.00	0.00	**2124.12**
16	Disaster Management Plan	275.00	42.00	41.50	41.50	0.00	0.00	**400.00**
17	Watershed Development Plan	74.26	0.00	0.00	0.00	0.00	0.00	**74.26**
	Total	**3934.08**	**670.36**	**645.37**	**895.18**	**533.00**	**9.29**	**6687.28**
* Diversion of forest land is not required for the proposed project. **150.74 ha of non-forest land identified for the proposed project will be purchased directly from respective landowners through negotiations on a mutually agreed term.								

21.1.3 The EAC during deliberations noted the following:

The EAC deliberated on the information submitted and presented during the meeting, observing that the proposal is for the grant of Environmental Clearance (EC) to the project for Tarali Open Loop Pumped Storage Project (1500 MW) in an area of 150.74 Ha located at Village Nivade, Tondoshi, Kalambe and Jalu, Sub District Patan, District Satara, Maharashtra by M/s Adani Green Energy Limited.

The project is listed under S.N.1(c) of the Schedule to the Environmental Impact Assessment (EIA) Notification as a Category 'A' project, which requires appraisal at the Central level by the Expert Appraisal Committee (EAC).

The EAC, constituted under the provisions of the EIA Notification, 2006, and comprising expert members/domain experts in various fields, examined the proposal submitted by the Project Proponent, including the EIA/EMP reports prepared and submitted by the Consultant accredited by QCI/NABET on behalf of the Project Proponent.

The EAC noted that the Project Proponent has provided an undertaking affirming that the data and information provided in the application and enclosures are accurate to the best of their knowledge, with no suppression of information in the EIA/EMP reports. The proponent also acknowledged that if any part of the data/information submitted is found to be false or misleading at any stage, the project will be rejected, and any Environmental Clearance granted will be revoked at the risk and cost of the Project Proponent.

The EAC noted that the Terms of Reference (ToRs) were issued by the Ministry via letter no. J-12011/14/2022-IA. I(R) dated 9.11.2022. The ToR was accorded by Ministry of Environment Forests and Climate Change (MoEF&CC), Government of India vide. Subsequently, due to change in location and configuration of project components; amendment in ToR for 1500 MW installed capacity issued on 3.01.2024.The EAC observed that the baseline data for the EIA/EMP studies was collected in January 2023 to May 2023.

The total land required for the project is 150.74 ha out of which none is a Forest Land and 150.74 ha is Non-forest Land. Therefore, there is no requirement of forest clearance. In case tree falling is required in the region the EAC opined that PP shall obtain necessary clearance/permission from the forest department.

The EAC deliberated on the issues raised by the General Public and response/commitments made by the PP as mentioned in the Public Hearing Report. The Public hearing was chaired by the Upper District Magistrate, Satara, Maharashtra. It was also noted that several representations were received against the project and accordingly it was recommended by the EAC during its previous meeting (28th meeting held on 19.12.2024) to forward the representations received to the PP to provide appropriate response. The PP vide email dated 30.12.2024 has submitted the response to the representations received. The EAC after detailed deliberations observed that the response given by the PP to the issues raised by the general Public are satisfactory. The EAC suggested to implement the commitments made during public hearing in a time bound manner. A detailed action plan be submitted before RO in this regard within 6 months.

The EAC also examined the watershed management plan and observed that it needs revision in activities/budget proposed for watershed development and management in an effective manner. The PP submitted the revised watershed management plan on the same day through email. The EAC found it satisfactory and suggested that the location of the construction of Check Dam, Contour Trench, Farm Ponds, Percolation ponds etc. shall be demarcated on the watershed map delineated during the study and submitted to the RO for effective monitoring of the progress of implementation of watershed development within 10 km radius of the project site.

The EAC observed that Hydrology chapter of Tarali PSP has been approved by the CWC vide File No. T-11031/2/2023-HYD(S) DTE dated 04.12.2023 and Pre-DPR Chapter on Power Evacuation system of Tarali PSP is approved by CEA vide File No. CEA-PS-11-23(23)/1/2024-PSPA-I Division.

21.1.4 The EAC after examining the information submitted and detailed deliberations recommended the proposal for grant of prior Environmental Clearance by the Ministry to Tarali Open Loop Pumped Storage Project (1500 MW) in an area of 150.74 Ha located at Village Nivade, Tondoshi, Kalambe and Jalu, Sub District Patan, District Satara, Maharashtra by M/s Adani Green Energy Limited, under the provisions of EIA Notification, 2006 and as amended

with subject to compliance of applicable Standard EC conditions with the following specific environmental safeguard 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 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.

iii. The contract clause limiting the No. of vehicles used during excavation and transportation shall followed scrupulously and the same shall informed to the ministry.

iv. 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.

v. 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.

vi. 10000 plants shall be planted around the muck disposal area and the survival of plants shall be submitted with the 6 monthly compliance report.

vii. Plantation of saplings shall be carried out as a part of the tree plantation campaign "Ek Ped Ma Ke Naam" and the details of the same shall be uploaded in the MeriLiFE Portal (https://merilife.nic.in).

viii. Watershed development plan prepared in consultation with ICAR/expert Govt. institute 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.

[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 and managed to provide free quality education for children from project affected villages/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/local 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. The conditions mentioned in the Western Ghats notification (draft notification no. S.O.3060(E) dated 31.07.2024) for development of hydro-power projects issued by the MOEF&CC shall be complied with.

iii. Bio-Gas plant shall be installed in the Project affected area for Utilizing Cattle waste (Cow Dung) into renewable source of fuel.

iv. 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.

v. 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.

vi. 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. 21.2

Warsgaon Warangi Close Loop Pumped Storage Project (1500 MW) in an area of 226.16 Ha located at Village Khanu, Teckpole and Warangi, Sub District Velhe and Mahad, District Pune and Raigad, Maharashtra by M/s Adani Green Energy Limited – Terms of Reference (TOR) - reg.

[Proposal No. IA/MH/RIV/515161/2024; F. No. J-12011/19/2022-IA.I (R)]

21.2.1: The proposal is for grant of Terms of References (ToR) to the project for Warsgaon Warangi Close Loop Pumped Storage Project (1500 MW) in an area of 226.16 Ha located at Village Khanu, Teckpole and Warangi, Sub District Velhe and Mahad, District Pune and Raigad, Maharashtra by M/s Adani Green Energy Limited.

21.2.2 The Project Proponent and the accredited Consultant R. S. Envirolinks Technologies Pvt. Ltd., made a detailed presentation on the salient features of the project and informed that:

i. Warasgaon Warangi Pumped Storage Project is an Off-stream Closed Loop pumped storage scheme with an installed capacity of 1500 MW (4x300 MW + 2x150 MW). Project is located in Pune and Raigad district of Maharashtra.

ii. The upper and lower dams for the project are proposed to be newly constructed. It is proposed to utilize the 552.83m head available between upper dam proposed across a minor nallah draining into Ambi river and lower dam proposed across a nallah draining into Kal River. The upper dam is located on a rocky ridge near Teckpole village in Velhe Taluka, Pune district of Maharashtra. Whereas the lower dam is located on a rocky ridge near Warangi village in Mahad Taluka, Raigad district of Maharashtra.

iii. The scheme of operation considered for the project is daily regulation to meet the demand of about 6.41 hours of peak power daily. Off-peak pumping hours are considered as 7.43 hours daily.

iv. Water will be sourced from Kal River for initial filling and annual recuperation of losses. Water requirement for the initial filling of the reservoirs (onetime) is about 13.1 Mm3, which includes losses from upper and lower reservoir. The annual water requirement for recuperating losses in upper & lower reservoir storage due to evaporation, transit and seepage is estimated to be 1.26 Mm3.

v. **PROJECT BACKGROUND:**

- Initially, TOR was issued by MoEF&CC vide its letter dated 13/02/2023 for the installed capacity of 1200 MW.
- After TOR, during survey and investigation and in the process of obtaining various approvals from authorities, there were changes in the project parameters, requiring TOR amendment.
- The proposal for TOR amendment was submitted to MOEF&CC and the same was discussed in 16th meeting of EAC dated 27/09/2024.
- Following changes were proposed:
  - Minor change in locations of the upper reservoir
  - Change in installed capacity from 1200MW (5x240MW) to 1500MW (4x300MW+ 2x150MW)
  - Change in land requirement from 168.95 ha to 226.16 ha
  - Change in forest land requirement from 24.50 ha to 90.0 ha

- The EAC returned the proposal in the present form and made following recommendations:

  - The project proposes to use water of the catchment of lower reservoir for initial filling and annual recuperation of losses. This will impact several small rivulets draining into these reservoirs as the water will not be released downstream.

  - The EAC was of the view that PP has changed configuration of the project drastically which could attract more impact on the environment. The EAC raised its concerns about change in the total forest land required for the project with increase of more than three times i.e. from 24.50 Ha to 88.98 Ha.

  - The EAC also noted that the PP has not applied for Stage-I forest clearance as per time period given as per OM dated 01.08.2013, which stipulates for submission of application for Stage-I Forest Clearance within 6 months of grant of TOR.

  - Accordingly, the EAC suggested the PP to submit a fresh proposal for grant of TOR with modified PFR.

- In line with the EAC's recommendations the revised proposal has been submitted.

vi. Upper dam is located on a rocky ridge near Teckpole village in Velhe Taluka, Pune

district of Maharashtra state having a geographical latitude 18°18'44.3374"N and longitude 73°28'8.8284"E. The catchment area up to upper dam site is estimated to be about 7.4 km2. Lower dam is located on a rocky ridge near Warangi village in Mahad Taluka, Raigad district of Maharashtra state having a geographical latitude 18°16'7.2444"N and longitude 73°27' 50.3928"E. The catchment area up to the existing lower dam is about 14.7 km2.

vii. The total land required for the construction of various components and related works for Warasgaon Warangi PSP is estimated to be around 226.16 ha, out of which 136.16ha is non-forest land and 90.00ha is forest land. Diversion of forest land for non-forest purpose will be involved for construction of Warasgaon Warangi project components. Therefore, Forest Clearance is required to be obtained under Forest Conservation Act. Distance from nearest protected area (Tamhini WLS) is 9.50km, however, proposed project is outside the notified ESZ boundary of the sanctuary.

viii. The estimated project cost is Rs. 5516.8 Crores including IDC. As a preliminary estimate, a construction period of 4 years (48 months) from the date of award of civil works package has been estimated for this project.

ix. **Environmental Sensitive area:**

ESZ of Tamhini WLS is notified on 25/02/2021 as 100m to 3.5km around the boundary. ESZ boundary is 9.2km so wildlife clearance is not applicable. All the components of Warasgaon Warangi PSP are located within the proposed Western Ghats ESA, Maharashtra as per MOEF&CC draft notification no. S.O.30609(E) dated July 31, 2024.

x. Alternative Studies:

Total four (4) alternatives are studied in this selected Valley no. 4, which are compared. Among these four alternatives, alternative-1 was finalised during PFR studies (based on which earlier TOR was issued) and other three alternatives are formulated during later DPR studies.

The details are as under:

S.No.	Item	Alt-1	Alt-2	Alt-3	Alt-4
1	Upper Reservoir location	UR-1	UR-1	UR-2	UR-2
2	Upper Reservoir				
a	Dam Type	Concrete Gravity			
b	Dam length/Height (m/m)	451.3/71.0	451.3/71.0	315.0/56.0	315.0/56.0

3	Upper Intake	1 nos. Horizontal Type, 4 Bays 8.5m wide each	1 nos. Horizontal Type, 4 Bays 8.5m wide each	1 nos. Horizontal Type, 4 Bays 8.5m wide each	1 nos. Horizontal Type, 4 Bays 8.5m wide each
4	HRT, Nos./Dia./Length (m/m)	1/10.0/1696.7	1/10.0/1696.7	1/10.0/1651.6	1/10.0/2020.0
5	Surge Shaft, Dia./Height (m/m)	15.0/86.0	15.0/86.0	15.0/66.0	15.0/66.0
6	Pressure Shaft (PS)				
	Main, Dia./Length (m)	7.5/123.0	7.5/123.0	7.51/109.5	7.5/62.5
	Intermediate, Dia./Length (m)	5.9/781.0	5.9/781.0	5.9/1789.5	5.9/772.0
	Unit, Dia./Length (m)	3.4/576.0	3.4/374.0	3.4/675.0	3.4/374.0
	Total PS length, (m)	1480.0	1278.0	2574.0	1208.5
7	Powerhouse type	Surface	Underground	Surface	Underground
	Size, LxBxH, (m)	187.0m x 21m x 34m	187.0m x 21 m x 34m	187.0m x 21m x 34m	187.0m x 21m x 34m
8	Tail Race Tunnel				
	Main, nos/Dia./Length, (m)	5nos./4.5/146.0	1/10.0/653.0	5 nos./ 4.5/146.0	1/10.0/653.0
	Intermediate, Dia./Length, (m)	-	2nos/7.7/90.5	-	2nos/7.7/90.5
	Unit, Dia./Length, (m)	-	5nos./4.5/126.5	-	5nos./4.5/126.5
	Total TRT length, (m)	146.0	870.0	146.0	870.0
	Total WCS length, (m)	3322.7	3844.7	4371.7	4098.5
9	L/H Ratio	5.82	6.68	7.97	7.41
10	Downstream Gate chamber	No	Yes	No	Yes
	Height, (m)	-	83.2	-	83.2
11	Lower Intake	5 nos. Horizontal	1 nos. Horizontal	5 nos. Horizontal	1 nos. Horizontal Type, 4 Bays

		Type, 2 Bays 6.75m wide each	Type, 4 Bays 8.0m wide each	Type, 2 Bays 6.75m wide each	8.0m wide each
12	Dam Type	Earth Core Rockfill Dam	Earth Core Rockfill Dam	Earth Core Rockfill Dam	Earth Core Rockfill Dam
13	Dam length/Height (m)	813.1/51.5	813.1/51.5	813.1/51.5	813.1/51.5
14	Storage Available for Generation UR (MCM)	7.61	7.61	7.10	7.10
15	Storage Available for Generation LR (MCM)	7.30	7.30	7.29	7.29
16	Rated Net head, Gen/Pump, m	570.98/ 601.33	575.13/598.53	548.73/ 577.83	552.83/ 575.03
17	Rated Discharge Gen./Pumping, cumec	320.45/ 274.78	318.13/ 276.07	312.6/ 268.08	310.28/ 269.39
18	Annual Energy Generation, MU	3532.23	3559.97	3298.46	3320.13
19	Daily generation Hours	6.37	6.42	6.34	6.38
20	Cycle Efficiency, %	78.04	78.92	78.05	78.95
21	**INSTALLED CAPACITY (MW)**	**1200**	**1600**	**1500**	**1500**

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

1	**PROJECT DETAILS**				
i	Name of the Proposal	:	Waragaon Warangi Pumped Storage Project (1500MW)		
ii	Location (including coordinates)	:	**Reservoir**	**Latitude**	**Longitude**
			Lower Reservoir	18°16'7.2444"N	73°27'50.3928"E
			Upper Reservoir	18°18'44.3374"N	73°28'8.8284"E
iii	Interstate Issue	:	No		
iv	Seismic Zone	:	Zone-III		
2	**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
3	**ELECTRICITY GENERATION AND CAPACITY**		
i	Powerhouse Installed Capacity	:	1500 MW
ii	Generation of Electricity Annually	:	3335.74 MU
iii	No. of Units	:	6 nos. (4X300 MW+2X150 MW)
4.	**Additional information (if any)**	**:**	**Nil**
5	**TOR/EC DETAILS**		
i	Cost of project	:	INR 5516.8 crore
ii	Total area of Project	:	226.16 ha
iii	Height of Dam from Riverbed (EL)	:	Lower Dam – 51.50 m Upper Dam – 56.0 m
iv	Length of Tunnel/Channel	:	1970.0 m
v	Details of Submergence area	:	144.30 ha
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)	:	20.0ha Non-Forest 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	:	136.16ha
ii	Government land/Forest Land	:	90.0ha
iii	Submergence area/Reservoir area	:	144.30ha
iv	Land required for project components	:	81.86ha
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 (Tamhini WLS) is 9.50 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**		

12	**MISCELLANEOUS**		
	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)
	Address	:	403, Bestech Chambers, Block-B, Sushant Lok Phase I, Sector 43, Gurugram, Haryana – 122009
	Email	:	ravi@rstechnologies.co.in
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

12	**MISCELLANEOUS**		
			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.
iii	Status of other statutory clearances	:	Online application seeking forest diversion for around 90.0 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
iv	R&R Details	:	Details shall be evaluated during EIA/EMP Studies
v	Additional Details if any	:	Nil

21.2.3 The EAC during deliberations noted the following:

The EAC deliberated on the information submitted (Form 1, PFR, kml file, etc.) and as presented in the meeting and observed that the proposal is for grant of TOR to the project for conducting EIA/EMP and Public hearing for Warsgaon Warangi Close Loop Pumped Storage Project (1500 MW) in an area of 226.16 Ha located at Village Khanu, Teckpole and Warangi, Sub District Velhe and Mahad, District Pune and Raigad, Maharashtra by M/s Adani Green Energy Limited.

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

The total land requirement for the project is around 226.16 ha, out of which 136.16ha is non-forest land and 90.00ha is forest land, Distance from nearest protected area (Tamhini WLS) is 9.50km, however, proposed project is outside the notified ESZ boundary of the sanctuary

Additionally, the Project Proponent has submitted a Memorandum of Understanding (MoU) dated 03.09.2024, signed between the Department of Water Resources, Government of Maharashtra and M/s Adani Green Energy Limited., granting in-principle approval for the establishment of the Pumped Storage Project with a capacity of 1500 MW in District Satara.

The EAC noted that earlier ToR was granted by the MoEF&CC vide its letter dated 13/02/2023 for the installed capacity of 1200 MW. Afterwards, PP submitted the proposal for amendment in ToR for change in change in locations of the upper reservoir, change in installed capacity from 1200MW (5x240MW) to 1500MW (4x300MW+ 2x150MW), change in land requirement from 168.95 ha to 226.16 ha including huge change in change in forest land requirement from

24.50 ha to 90.0 ha. The EAC in its meeting held on 16th meeting of EAC dated 27/09/2024 returned the proposal in the present form and asked PP to obtained fresh Terms of Reference from the Ministry.

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

The EAC noted that Upper dam proposed across a small stream draining into Ambi river which is a non-perennial river stream, therefore the project cannot be treated as close loop project and it will treated as open loop project. The EAC opined that PP shall make provisions in the project design to release self-catchment water in the downstream of Ambi river in monsoon season, as the water source of the project is the Tarali Lake which is proposed to be used as lower reservoir. The hydrological data certified by the CWC/State Water Resource Department, of water that is received by the small stream on which upper reservoir shall be constructed, be submitted. The PP will submit a monitoring mechanism for releasing the self -catchment water of small streams along with action plan for conservation and protection of other streams/rivulets within 10 km radius of the project.

21.2.4 The EAC based on the information submitted and as presented during the meeting, recommended the proposal for grant of Specific ToR issued by the Ministry for Open Loop Pumped Storage Projects vide OM dated 14.08.2023 for conducting EIA study for proposed construction of the project for Warsgaon Warangi Open Loop Pumped Storage Project (1500 MW) in an area of 226.16 Ha located at Village Khanu, Teckpole and Warangi, Sub District Velhe and Mahad, District Pune and Raigad, Maharashtra 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. The PP will submit 10 years water availability data certified by the CWC/State Water Resource Department for quantity of water that is received annually by the small stream on which upper reservoir is proposed to be constructed.

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

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

iv. Explore the possibilities for reducing the Forest land requirement. The application for obtaining Stage I FC for 90 Ha of forest land involved in the project shall be submitted within stipulated time.

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

vi. 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.

vii. PP shall submit the detailed plan for filling the reservoir for generating additional power by PSP other than currently operational plant.

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

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

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

xi. Calculation and values of GHGs (CO2, CH4 etc.) emissions during construction and during operation till the life of the project shall be estimated and submitted.

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

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

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

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

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

shall be submitted.

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

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

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

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

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

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

xxiii. A Sub-committee comprising members from EAC shall visit the site before considering the proposal for EC in view of the location of project located in Western Ghats.

[B] Socio-economic Study

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

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

xxvi. 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.

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

[C] Muck Management/ Disaster Management

xxviii. 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.

xxix. 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.

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. 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.

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

[E] Miscellaneous

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

xxxv. Pre-DPR Chapters viz. Layout Map and Power Potential Studies duly approved by

CWC/CEA shall be submitted.

xxxvi. 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.

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

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

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

xl. 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.

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

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

Agenda Item No. 21.3

Chentikheda Major Irrigation Project (CCA: 15300 ha) in an area of 1361.25 Ha Located at Villages Agra, Bijaipur, Devra, Garhi and etc., Sub-district Vijaypur and Sabalgarh, District Sheopur and Morena, Madhya Pradesh by M/s Water Resources Department, Government of Madhya Pradesh – Reconsideration of Terms of References (TOR) – reg.

[Proposal No. IA/MP/RIV/500241/2024; F. No. J-12011/28/2024-IA.I (R)]

21.3.1: The proposal is for grant of Terms of References (ToR) to the project for Chentikheda Major Irrigation Project (CCA: 15300 ha) in an area of 1361.25 Ha Located at Villages Agra, Bijaipur, Devra, Garhi and etc., Sub-district Vijaypur and Sabalgarh, District Sheopur and

Morena, Madhya Pradesh by M/s Water Resources Department, Government of Madhya Pradesh.

The EAC considered the proposal in 19th meeting held on 19th December, 2024 and defrred the proposal due to PP's lack of adherence to procedural requirements, specifically the failure to circulate the requisite documents to committee members before the scheduled meeting and PP lack of seriousness in presenting their proposal.

21.3.2 The Project Proponent and the accredited Consultant M/s PDCOR Limited, Jaipur, mad a detailed presentation on the salient features of the project and informed that:

i. Chentikheda Irrigation Project is designed to sustain all the possible uses in future. Chentikheda irrigation project envisages construction of a dam on River kunwari, a tributary of River Sindh in Yamuna basin, located near Village-Chentikheda in Tehsil- Vijaypur of District- Sheopur in Madhya Pradesh at Lat 25°58'3.5" N and Long 77°17'2.15" E.

ii. The dam on completion will provide irrigation facilities to 55 villages of sheopur and Morena districts, of MP, out of which 39 villages are located in Vijaypur tehsil of Sheopur district and 16 villages in sabalgarh tehsil of Morena district, all these villages are presently unirrigated.

iii. The unique feature of the project is that entire distribution of water for irrigation is through pressurized pipes which shall be laid underground, and irrigation in fields is by sprinkler system only, no flooding irrigation is proposed. The pipes will extend up to last 5 ha block, after that farmers would install their own sprinkler system and irrigated their farms. The cultivable command area of the project is 15300 ha.

iv. **MAIN FEATURES OF THE DAM:** The dam is having a catchment area of 481.25 sq km, which shall be partly hilly with thick vegetation and partly sloping ground, the dam shall be a composite dam, i.e. the spillway portion will be made of cement concrete and fitted with 7 no steel gates for release of excess flood water and non over flow portion will also be of concrete for some length and flanks would be earthen. The mean annual rainfall in the catchment is 668.41 mm. The annual yield of water works to be 67.88 MCM, the gross and live storage capacities of the dam are 61.05 MCM and 57.44 MCM respectively. The entire distribution of water shall be underground laid pressure pipes, up to 5 Ha block, beyond which farmers would lay their own sprinkle system, there would no flooding irrigation.

v. It is proposed to irrigate 15300 ha of land in Rabi season by efficient pressurized pipe network to facilitate farmers with assured water and head for adopting micro

irrigation techniques.

vi. The estimated cost of project is ₹ Total cost 539.00 crores (including 18% GST except B land) which is about ₹ 3.52 lakh per hectare which is acceptable considering economically backword tribal population.

vii. The total land coming under submergence is 1361.25 Hact. Details of land are given as follows.

S.N.	Type of land	Area	Unit
i	Private Land	709.51	hact
ii	Govt land	587.14	hact
iii	Forest land	64.60	hact
	Total	1361.25	hact
	No of families affected	1264	No
	No of ST families affected	892	no

The total land likely to be submerged is less than 10% of CCA. The rehabilitation and resettlement of outsees is proposed to be done in accordance with Land acquisition and resettlement act 2013 of Govt of India. The proposed Chentikheda Irrigation project is located in the close vicinity of Kuno National Park.

viii. **Environmental Sensitive area:** The Kuno National Park is located within 10 km distance from the project site. River is flowing nearby in south direction.

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

Municipal Solid waste will be estimated 50 TPA and it will be disposed by authorized vendor. Muck;- Total muck generated 3.69 MCM (After swelling factor 1.33) out of this after laying project pipeline 1.98 MCM will be filled back and remaining Muck to be disposed is 1.71 MCM. As per GAD additional quantity of Muck apart from back filling is used in leveling of low laying area creating access and approach road in non-forest area. It will be prudent to utilize fertile soil in the command area by distributing it to nearby farmers.

x. **Alternative Studies:** Following three Alternative sites were examine

S No	Parameters	Alternative 1	Alternative 2	Alternative 3 (Proposed Project)
1	Latitude	25°57'28.42"N	25°58'28.01"N	25°58’3.5” N
2	Longitude	77°16'1.38"E	77°17'26.04"E	77°17’2.15" E
3	Appx. Submergence area	789.06 Ha	2049 Ha	1361.25 Ha
5	Capacity and submergence area	Dam capacity is very less and not sufficient to feed required command area and if the height of Dam is increased to meet the water requirement, then a densely populated Agar Village will get Submerged causing increased R&R practices.	In terms of command area dam capacity is sufficient but the dam length requirement comes out large causing excessive Submergence.	Designed capacity achieved to irrigate required command area. Also reduced in submergence of forest, Govt and Pvt land then Alternative-2.
6	Overhead tank	Suitable location for overhead tank is not available in the vicinity.	Cost of construction of overhead tank is high because of depressed ground level less bearing capacity soil available in the vicinity.	Suitable location (hill area) for overhead tank construction found nearby making it the most economical site for overhead tank assembly
7	Length of Dam	3576 m	5793 m	4329.88 m
8	Command area	As Dam capacity is lower than designed capacity accordingly	As Dam capacity is sufficient to feed the required command area	As Dam capacity is sufficient to feed the required command area

		command area needs to reduce		
9	Technical feasibility	No sufficient water is available to feed required command area Not feasible	In this alternative submergence area (including Forest, Govt and private land) will increase which leads high project cost Not feasible	This alternative is technically feasible as estimate project cost is low comparable Alternative -1 & 2
10	Financial Approval	Not approved by govt.	Not approved by govt.	Approved by govt.

xi. The salient features of the projects area as under:

1. Project details:

Name of the Proposal	Chentikheda Major Irrigation Project
Location (Including coordinates)	Lat 25°58’3.5” N and Long 77°17’2.15" E.
Inter- state issue involved	No
Seismic zone	Zone – II

2. Category details:

Category of the project	B1
Provisions	EIA Notification 2006 & amendment
Capacity / Cultural command area (CCA)	15300 Ha
Attracts the General Conditions (Yes/No)	Yes
Additional information (if any)	-

3. ToR /EC Details:

Cost of project	539 Cr
Total area of Project	CCA 15300 Ha

Height of Dam from River Bed (EL)	27.30 m
Length of Tunnel/Channel	381 Km Pipe network proposed (length of main pipeline 38km and distribution 343km)
Details of Submergence area	1361.25 Ha
Types of Waste and construction/Operation Quantity of generation during	Municipal Solid Waste from labour colony & Excavated Muck
E-Flows for the Project	Provision of environmental release of 0.20 MCM
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

4. Muck Management Details:

No. of proposed disposal area/(type of land- Forest/Pvt. land)	Mostly, the wastes from excavation activities will be reutilized for land leveling & construction of dam earthen embankment, approach road etc. The remaining less quantity of solid waste will be disposed of at low lying area within project area
Muck Management Plan	Details of Solid waste/ Hazardous waste generation/ Muck and its management Municipal Solid waste will be estimated 50 TPA and it will be disposed by authorized vendor. Muck;- Total muck generated 3.69 MCM (After swelling factor 1.33) out of this after laying project pipeline 1.98 MCM will be filled back and remaining Muck to be disposed is 1.71 MCM. As per GAD additional quantity of Muck apart from back filling is used in leveling of low laying area creating access and approach road in non-forest area. It will be prudent to utilize fertile soil in the command area by distributing it to nearby farmers.

5. Land Area Breakup:

Private land	709.50 Ha
Government land/Forest Land	651.75 Ha
Submergence area/Reservoir area	1361.25 Ha
Land required for project components	1361.25 Ha including Government land
Additional information (if any)	-

6. 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	64.60 Ha
National Park	Yes	Kuno National Park
Wildlife Sanctuary	Yes	Palpur-Kuno Wildlife Sanctuary

7. Court case details: Nil

8. Miscellaneous

Details of consultant	M/s PDCOR Limited, Jaipur
Project Benefits	On completion of the Project the following benefits can be derived: • 15300 Ha. Agriculture land will be benefited • Rise in sub soil water level in the project area. • Development of fisheries in the reservoir. • Production of crops will increase Hence per capita income will increase • Employment to local labour largely tribes during construction period.
Status of other statutory clearances	Forest clearance is under process
R&R details	R&R yet to be started

Additional detail (If any)	Nil

21.3.3 The EAC during deliberations noted the following:

The EAC deliberated on the information submitted (Form 1, PFR, kml file, etc.) and as presented in the meeting and observed that the proposal is for grant of TOR to the project for conducting EIA/EMP and Public hearing for Chentikheda Major Irrigation Project (CCA: 15300 ha) in an area of 1361.25 Ha Located at Villages Agra, Bijaipur, Devra, Garhi and etc., Sub-district Vijaypur and Sabalgarh, District Sheopur and Morena, Madhya Pradesh by M/s Water Resources Department, Government of Madhya Pradesh.

The EAC noted that the as per the provisions the project comes under "B1" category as it is a major irrigation project because the CCA lies between ≥10,000 ha i.e. 15300 Ha. of CCA for which only EMP is required. However due to presence of Kuno National Park is located within 10 km distance from the project site the project transformed to category 'A' project and will be appraised at central level.

In view of the Kuno National Park is located within 10 km distance from the project boundary the EAC emphasis to prepare detailed wildlife conservation plan including a baseline assessment of biodiversity, habitat quality, and wildlife corridors, along with an impact analysis of the project and mitigation measures, such as creating green buffers, minimizing disturbances, and implementing biodiversity-friendly practices, must be outlined.

The total land requirement for the project is 1361.25 Ha out of which 651.75 Ha is forest land/government land, 709.50 Ha is private land. It was noted that the application for Stage-I Forest Clearance for the diversion of 72.27 ha Forest land was submitted to MoE&FCC vide letter No. FP/MP/HYD/IRRIG/502063/2024, Date 03.11.2024.

19.3.4 The EAC based on the information submitted and as presented during the meeting, **recommended** the proposal for grant of Specific ToR issued by the Ministry for conducting EIA/EMP and Public hearing for Chentikheda Major Irrigation Project (CCA: 15300 ha) in an area of 1361.25 Ha Located at Villages Agra, Bijaipur, Devra, Garhi and etc., Sub-district Vijaypur and Sabalgarh, District Sheopur and Morena, Madhya Pradesh by M/s Water Resources Department, Government of Madhya Pradesh, under the provisions of EIA Notification, 2006, as amended along with the following additional/specific ToR.

[A] Environmental Management and Biodiversity Conservation:

i. PP shall obtain NBWL Clearance in view of Kuno National Park is located within 10 km distance from the project boundary.

ii. Explore the possibilities for reducing the Forest land requirement.

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. The water of rainfall yield of self-catchment of the reservoir shall be released to downstream through body of dam/ barrage/ embankment etc.

v. Prepare Wildlife conservation plan specifically for avi-fauna with mitigation measures for minimizing the human–animal conflict and be suitably incorporated in the wildlife conservation plan in consultation with reputed government expert institute and State Forest Department.

vi. Prepare Environmental Cost Benefit Analysis in terms of ecological damage due to diversion of Forest land/ loss of biodiversity and its impacts on ecosystem, water availability, water uses for generation of hydro power in study area 10 km from periphery of Project components.

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

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

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

x. A detailed wildlife conservation plan for Schedule –I species, duly approved by the Chief Wildlife Warden, be submitted.

xi. 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.

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

xiii. Detail of rivulets around the project area and action plan for their survival shall be incorporated in EIA/EMP.

[B] Socio-economic Study

xiv. Public Health Delivery Plan including the provisions of drinking water supply for local population shall be in the EIA/EMP Report. Status of the existing medical facilities in the project area shall be discussed. Possibilities of strengthening of existing medical facilities, construction of new medical infrastructure etc. will be explored after assessing the need of the labour force and local population.

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

xvi. 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.

xvii. 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.

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

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

xx. 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.

[C] Muck Management/ Disaster Management

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

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

xxiii. Techno-economic viability of the project must be recommended from CEA/ CWC.

[D] Miscellaneous.

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

xxv. 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.

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

xxvii. 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.

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

21.4 Additional Agenda item:

Teesta Stage III HE Project (1200 MW), Sikkim by Sikkim Urja Limited (SUL) located at North District, Sikkim (Proposal No. IA/SK/RIV/499039/2024)- Consideration of Site Visit Report

The Member Secretary, EAC informed that Teesta Stage III HE Project (1200 MW), Sikkim by Sikkim Urja Limited (SUL) located at North District, Sikkim was considered during 19th Meeting of the EAC (RVHEP) held on 30th November 2024 for grant of amendment in environmental clearance issued by MoEF&CC (erstwhile Ministry of Environment & Forests) on 04.08.2006 under EIA Notification of 1994. The EAC while considering the proposal observed that the Project was commissioned in 2017, the Project faced a flash flood on 3.04.2023 which led to the washing away of the Concrete Faced Rock Filled Dam (CFRD) and flooding of the underground Powerhouse leading to halting of Project operations. where after detailed of all the information, EAC deferred the case and opined to conduct a site visit by a sub-committee of the EAC members before giving any recommendation on the proposal. The EAC expressed serious concerns regarding the dam's design and stability; its ability to withstand potential natural disasters in the future. The committee emphasized the need for a thorough review of the proposed modifications to ensure the structural resilience and safety of the dam, particularly given the region's susceptibility to extreme hydrological events.

Accordingly, the Sub- Committee comprising following EAC members conducted a site visit from 26.12.2024 to 28.12.2024 of Teesta III HEP Project -

S. No	Name	Role
1	Prof. Govind Chakrapani	Chairman
2	Shri Rajeev Varshney	Member

3	Shri Lalit Mohan Meena	Representative of Central Water Commission
4	Shri Yogendra Pal Singh	Member Secretary

The sub-committee held detailed deliberations with the representatives of Sikkim Urja Limited on 26.12.2024 and visited the proposed Dam site on 27.12.2024.

The sub-committee reviewed the details presented by SUL on proposed Dam design and whether the proposed design duly incorporates measures on safety of the Dam, stability of the structure and its ability to withstand potential natural disasters in the future:

Features	CFRD	Concrete Dam	Safety Aspects
Type of Dam	Concrete Faced Rockfill Dam (CFRD)	Concrete Gravity Dam (CGD)	Dam design changed from CFRD to CGD which is considered safe in the event of overtopping
Design consideration for Spillway discharge	PMF: 7,000 cumecs	PMF + GLOF (7000+12,946 cumecs)	• GLOF of 12,946 Cumecs approved by CWC. • GLOF considered with the breach of 2 big lakes GL31 and GL32 simultaneously. (Worst Case Scenario) • Spillway capacity of 20,012 cumecs is to cater to simultaneous occurrence of PMF & GLOF which is most improbable event.
Seismic Parameters	CFRD designed for seismic co-efficient based on time history study till 2010	Reassessment of seismic study has been carried out by IIT Roorkee by updating time history study to current date	Study recommends pseudo-static co-efficient are $\alpha h = 0.18$ & $\alpha v = 0.12$ which has been considered in design.

1. Type of Dam has been changed from CFRD to concrete gravity which is a much resilient structure minimizing the chance of Dam failure due to overtopping. SUL is employing various measures like jet grouting, permeation grouting to improve the ground conditions and control seepage for the Stage I works.

2. The sub-committee sought the details of GLOF study and whether all lakes in the catchment of the Teesta III Project have been studied and mapped to ascertain future risks. The Project

proponent explained that total 119 Glacial lakes were identified in the catchment. Out of these, 50 glacial lakes were shortlisted with area of 10 ha or more for further evaluation. After detailed study, 13 potentially dangerous glacial lakes were identified based on the water spread area (40 Ha or more), volume and distance. During criticality analysis, combination of lakes was studied to find out the worst-case scenario. Three different combinations were studied, and worst combination was considered for GLOF. In the worst-case combination, highest combined volume from simultaneous breach of two lakes i.e. 109.44 MCM was considered, which gives a GLOF flood value of 12946 cumec. The value have been approved by CWC.

3. Further, the Dam spillway capacity has been enhanced from 7,000 cumec to 19,946 cumec by considering both GLOF and PMF. The spillway crest is lowered to enhance spillway safety parameters. Although, the free board requirement for a concrete gravity dam is only 2.5 m, to have additional safety, the free board is kept 5.0 m, this provides additional operational safety to the Project in case of future floods. This is subject to approval by the statutory authorities.

4. It was informed that site for the proposed concrete gravity Dam has been carefully chosen after detailed geological investigations. During DPR stage, surface & sub-surface investigations (detailed surface geological mapping, drilling and drifting, geophysical survey etc.) were carried out by the Project Proponent. Joint site visit of GSI & CWC was conducted to ascertain site suitability. GSI has confirmed Dam site suitability based on evaluation of study of 3D geological logs of drifts/tunnels, Bore hole logs. GSI had also directed for additional confirmatory investigations which are being carried out by the Project.

5. During the site visit of the Dam at Chungthang, the sub-committee noted the ongoing confirmatory investigation works being carried out as per advise of GSI and checked the drill hole core boxes. The sub-committee also noted that the Project has made temporary access roads/ paths for carrying out survey & investigation works. The sub-committee also reviewed the damages to the CFRD which has been mostly washed away and there were some remnants on the right bank of the river Teesta. As regards to the earlier constructed concrete spillway, huge scouring was observed in the chute portion, the sub-committee observed that the concrete spillway is unsafe and should be removed. SUL confirmed that remnants of both CFRD and concrete spillway shall be dismantled.

6. To enhance the safety of the personnel working during Project operations, SUL has plans to shift the Dam control room to a higher elevation. Further, SUL will implement a Early Warning System in the upper catchment which gives sufficient time to shift the working manpower from the Dam site and safely operate and open all Dam gates in the event of a flood. In addition to this NDMA/ SSDMA and Sikkim Government are also in the stage of a development of a comprehensive EWS for the complete Teesta catchment for safety of all the Projects as well as downstream areas.

7. While the sub-committee noted that SUL is employing all suitable measures to enhance Dam safety to withstand impact of any potential natural disasters in the future, the sub-committee directed SUL to incorporate the following measures in construction / operation stage of the Project to enhance Dam safety parameters:

    a. To map all potential glacial lakes in the upper catchment of the Project and co-ordinate with the Central and State Disaster management authorities for taking information regarding monitoring of these lakes.
    b. Project should conduct workshops/ seminars/ conferences and invite domain experts from the fields of glacial studies, disaster management authorities from time to time.
    c. To map the landslides in the reservoir area of the Dam and extend the landslide study to 5 km in both Lachen and Lachung catchment and take actions for monitoring of potential landslides and mitigation measures for Dam safety.
    d. To carry out detailed geological mapping the Dam area for potential weak zones and take structural measures including slope stabilization measures for ensuring safety and integrity of the structure.
    e. To engage an independent third party expert/ committee/ consultant/ institute for monitoring of safe work procedures during Dam construction and later safe operation during Dam operations. This independent agency shall be mandated to visit the Project twice in a year to review the construction/ operations and submit observations & recommendations for the Project to implement.
    f. To develop and implement a robust Early Warning System (EWS) for generation and dissemination of timely warning information of the extreme flood events in the river catchment. The EWS should be integrated with Dam Gate operations to ensure Public Safety and the protection of human lives and enhance safe Dam operations. The EWS should have capability for transmission of warning signal generated to be transmitted to State Disaster Management Authority, NDMA, Sikkim State administration and downstream Projects to alert and safeguard the downstream areas. The EWS of the Project should be linked with the NDMA/ SSDMA and Sikkim Government comprehensive EWS.
    g. SUL should develop response criterion for Dam gate operations based on the EWS signal.
    h. The speed of opening of Dam Gates should be improved and implemented such that the full Dam Gates are operated and opened in the available time so that gates are fully opened in time in case of a natural disaster like flash flood or GLOF.

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

The EAC after deliberation on the recommendations of the site visit report recommended that the proposal for amendment in EC of Teesta -III HEP may be considered in the next EAC meeting in view of the above recommendations of the site visit report and further details/ response to be provided by the project proponent.

*****

e-KYC
CAF
DSS
e-Processing
e-Payments
e-Compliance
KYA
PARIVESH
CPC GREEN
Nature Protects if She is Protected

ANNEXURE

ATTENDANCE

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

Annexure I

Site visit report of the sub-committee of EAC to 1200 MW Teesta Stage III HE Project, Sikkim by Sikkim Urja Limited (SUL) located at North District, Sikkim

Proposal No. IA/SK/RIV/499039/2024

1. Pursuant to the recommendations made by the EAC, River Valley & Hydroelectric Projects during its 19th Meeting held on 30th November 2024, a site visit of Teesta III Project was conducted from 26.12.2024 to 28.12.2024 by a sub-committee of the following EAC Members-

S. No	Name	Role
1	Prof. Govind Chakrapani	Chairman
2	Shri Rajeev Varshney	Member
3	Shri Lalit Mohan Meena	Representative of Central Water Commission
4	Shri Yogendra Pal Singh	Member Secretary

The sub-committee held detailed deliberations with the representatives of Sikkim Urja Limited on 26.12.2024 and visited the proposed Dam site on 27.12.2024.

2. Environmental Clearance to Teesta Stage III Hydroelectric Project (1200 MW) was issued by Ministry of Environment & Forests on 04/08/2006 under EIA Notification of 1994. During construction, the Project underwent design changes, approval for the same was accorded in 2010 by MoEF&CC. Stage I Forest clearance for diversion of 83.0405 ha of forest land was approved on 12.10.2007 and Stage II on 02.11.2007. CEA accorded concurrence to 1200 MW Teesta III project vide letter no 2/SKM/11/05-CEA/PAC/751-75 dated 12.05.2006 & addendum on 14.06.2010.

3. Subsequent to receipt of all statutory clearances, the Project works started in 2008 and the project got commissioned in February 2017 and was in successful operation till 03/04 October 2023 when the Project faced a flash flood which led to the washing away of the Concrete Faced Rock Filled Dam (CFRD) and flooding of the underground Powerhouse leading to halting of Project operations.

4. The CFRD was washed away in the flood due to overtopping. There were some damages reported in the Water Conducting System and Power House. All other existing components of project including Powerhouse and electro-mechanical equipment have minor damages/ silted and requiring cleaning/ restoration.

5. To restart the operation, It is proposed to construct a new concrete gravity dam in place of the earlier CFRD. All the parameters of the earlier Dam like the location (shifted slightly 20 m u/s, the Dam top elevation, the Full reservoir level, Reservoir RIM area etc. are kept the same to utilise existing project components. The flood discharging capacity is enhanced

to 19,946 cumec in comparison to earlier 7,000 cumec by including provision of 12,946 cumecs for GLOF.

6. There is no additional land requirement neither forest nor non-forest.

7. To rehabilitate the project in shortest possible time, the restoration works are proposed in the two parts:

    a. Stage/Part I – To achieve partial generation by constructing a suitable upstream coffer dam and using the existing water conductor system and powerhouse. Partial generation using Coffer Dam will be achieved in about 08 months wherein around 60% of designed energy can be harnessed.
    b. Stage/Part II - To achieve complete generation by constructing a concrete gravity dam which should be capable of passing revised design flood. Restoration of main Dam will take around 36 months after start of partial generation.

8. For construction of concrete gravity dam in-place of washed out CFRD dam, project proponent has applied for amendment of environment clearance. Case was discussed in EAC meeting held on 30/11/2024, where after detailed of all the information, EAC deferred the case and opined to conduct a site visit by a sub-committee of the EAC members before giving any recommendation on the proposal. The EAC expressed serious concerns regarding the dam's design and stability; its ability to withstand potential natural disasters in the future. The committee emphasized the need for a thorough review of the proposed modifications to ensure the structural resilience and safety of the dam, particularly given the region's susceptibility to extreme hydrological events.

9. The sub-committee reviewed the details presented by SUL on proposed Dam design and whether the proposed design duly incorporates measures on safety of the Dam, stability of the structure and its ability to withstand potential natural disasters in the future:

Features	CFRD	Concrete Dam	Safety Aspects
Type of Dam	Concrete Faced Rockfill Dam (CFRD)	Concrete Gravity Dam (CGD)	Dam design changed from CFRD to CGD which is considered safe in the event of overtopping
Design consideration for Spillway discharge	PMF: 7,000 cumecs	PMF + GLOF (7000+12,946 cumecs)	• GLOF of 12,946 Cumecs approved by CWC. • GLOF considered with the breach of 2 big lakes GL31 and GL32 simultaneously. (Worst Case Scenario) • Spillway capacity of 20,012 cumecs is to cater to

Features	CFRD	Concrete Dam	Safety Aspects
			simultaneous occurrence of PMF & GLOF which is most improbable event.
Seismic Parameters	CFRD designed for seismic co-efficient based on time history study till 2010	Reassessment of seismic study has been carried out by IIT Roorkee by updating time history study to current date	Study recommends pseudo-static co-efficient are $\alpha h = 0.18$ & $\alpha v = 0.12$ which has been considered in design.

10. Type of Dam has been changed from CFRD to concrete gravity which is a much resilient structure minimizing the chance of Dam failure due to overtopping. SUL is employing various measures like jet grouting, permeation grouting to improve the ground conditions and control seepage for the Stage I works.

11. The sub-committee sought the details of GLOF study and whether all lakes in the catchment of the Teesta III Project have been studied and mapped to ascertain future risks. The Project proponent explained that total 119 Glacial lakes were identified in the catchment. Out of these, 50 glacial lakes were shortlisted with area of 10 ha or more for further evaluation. After detailed study, 13 potentially dangerous glacial lakes were identified based on the water spread area (40 Ha or more), volume and distance. During criticality analysis, combination of lakes was studied to find out the worst-case scenario. Three different combinations were studied, and worst combination was considered for GLOF. In the worst-case combination, highest combined volume from simultaneous breach of two lakes i.e. 109.44 MCM was considered, which gives a GLOF flood value of 12946 cumec. The value have been approved by CWC.

12. Further, the Dam spillway capacity has been enhanced from 7,000 cumec to 19,946 cumec by considering both GLOF and PMF. The spillway crest is lowered to enhance spillway safety parameters. Although, the free board requirement for a concrete gravity dam is only 2.5 m, to have additional safety, the free board is kept 5.0 m, this provides additional operational safety to the Project in case of future floods. This is subject to approval by the statutory authorities.

13. It was informed that site for the proposed concrete gravity Dam has been carefully chosen after detailed geological investigations. During DPR stage, surface & sub-surface investigations (detailed surface geological mapping, drilling and drifting, geophysical survey etc.) were carried out by the Project Proponent. Joint site visit of GSI & CWC was conducted to ascertain site suitability. GSI has confirmed Dam site suitability based on evaluation of study of 3D geological logs of drifts/tunnels, Bore hole logs. GSI had also

directed for additional confirmatory investigations which are being carried out by the Project.

14. During the site visit of the Dam at Chungthang, the sub-committee noted the ongoing confirmatory investigation works being carried out as per advise of GSI and checked the drill hole core boxes. The sub-committee also noted that the Project has made temporary access roads/ paths for carrying out survey & investigation works. The sub-committee also reviewed the damages to the CFRD which has been mostly washed away and there were some remnants on the right bank of the river Teesta. As regards to the earlier constructed concrete spillway, huge scouring was observed in the chute portion, the sub-committee observed that the concrete spillway is unsafe and should be removed. SUL confirmed that remnants of both CFRD and concrete spillway shall be dismantled.

15. To enhance the safety of the personnel working during Project operations, SUL has plans to shift the Dam control room to a higher elevation. Further, SUL will implement a Early Warning System in the upper catchment which gives sufficient time to shift the working manpower from the Dam site and safely operate and open all Dam gates in the event of a flood. In addition to this NDMA/ SSDMA and Sikkim Government are also in the stage of a development of a comprehensive EWS for the complete Teesta catchment for safety of all the Projects as well as downstream areas.

16. While the sub-committee noted that SUL is employing all suitable measures to enhance Dam safety to withstand impact of any potential natural disasters in the future, the sub-committee directed SUL to incorporate the following measures in construction / operation stage of the Project to enhance Dam safety parameters:

    a. To map all potential glacial lakes in the upper catchment of the Project and co-ordinate with the Central and State Disaster management authorities for taking information regarding monitoring of these lakes.
    b. Project should conduct workshops/ seminars/ conferences and invite domain experts from the fields of glacial studies, disaster management authorities from time to time.
    c. To map the landslides in the reservoir area of the Dam and extend the landslide study to 5 km in both Lachen and Lachung catchment and take actions for monitoring of potential landslides and mitigation measures for Dam safety.
    d. To carry out detailed geological mapping the Dam area for potential weak zones and take structural measures including slope stabilization measures for ensuring safety and integrity of the structure.
    e. To engage an independent third party expert/ committee/ consultant/ institute for monitoring of safe work procedures during Dam construction and later safe operation during Dam operations. This independent agency shall be mandated to visit the Project twice in a year to review the construction/ operations and submit observations & recommendations for the Project to implement.

f. To develop and implement a robust Early Warning System (EWS) for generation and dissemination of timely warning information of the extreme flood events in the river catchment. The EWS should be integrated with Dam Gate operations to ensure Public Safety and the protection of human lives and enhance safe Dam operations. The EWS should have capability for transmission of warning signal generated to be transmitted to State Disaster Management Authority, NDMA, Sikkim State administration and downstream Projects to alert and safeguard the downstream areas. The EWS of the Project should be linked with the NDMA/ SSDMA and Sikkim Government comprehensive EWS.

g. SUL should develop response criterion for Dam gate operations based on the EWS signal.

h. The speed of opening of Dam Gates should be improved and implemented such that the full Dam Gates are operated and opened in the available time so that gates are fully opened in time in case of a natural disaster like flash flood or GLOF.

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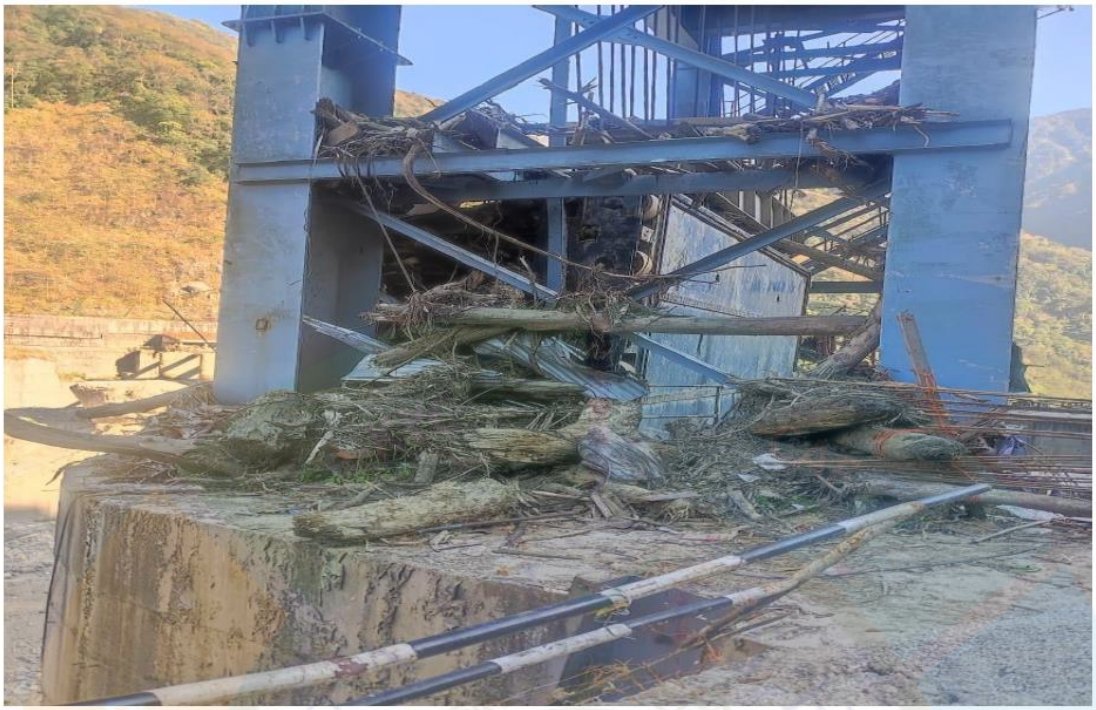

Fig1.Damaged Gate Structure

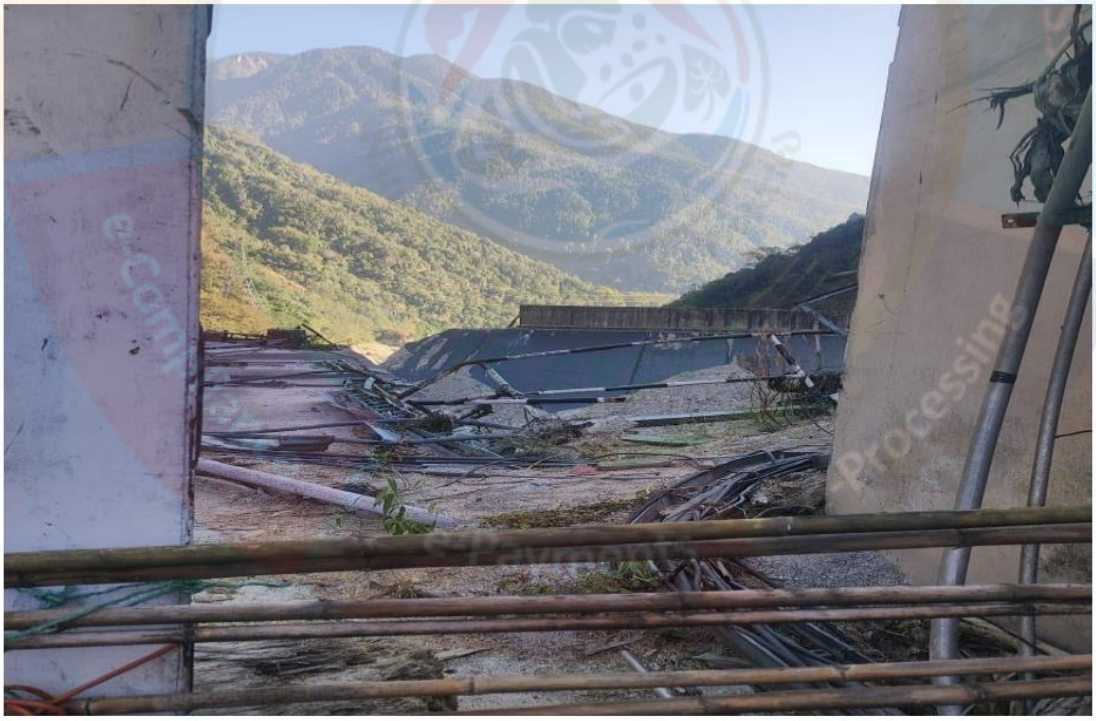

Fig: Damaged chute spillway

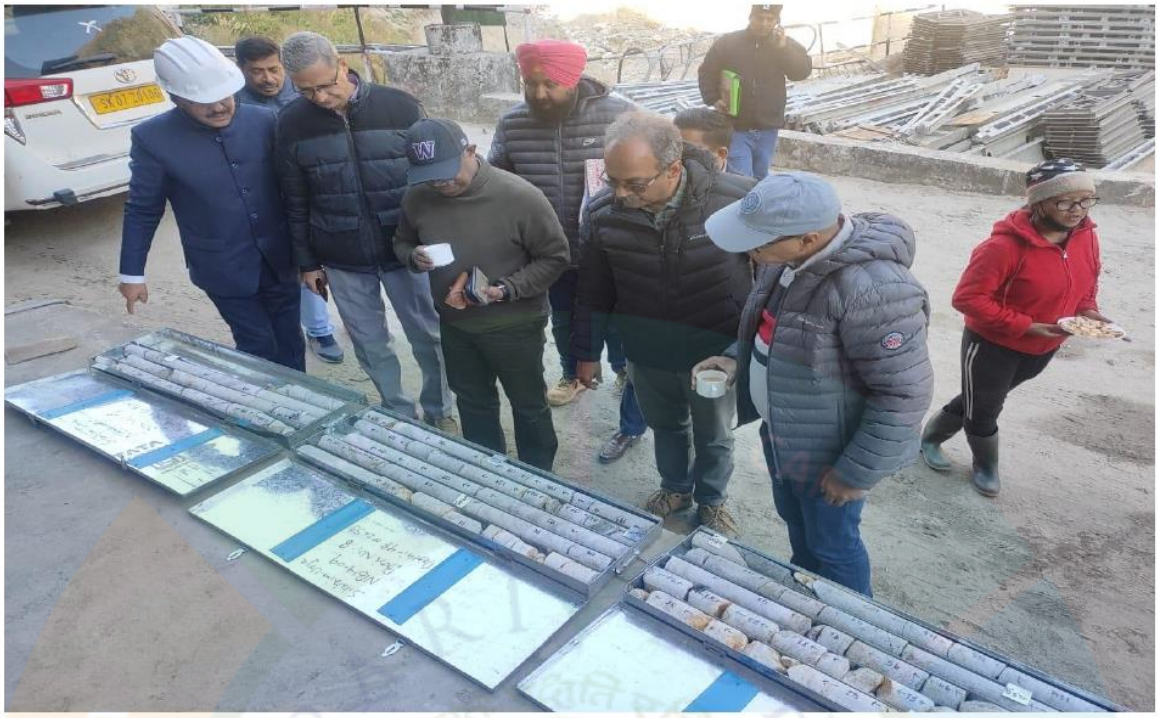

Fig: Inspection of drill core logs at dam site.

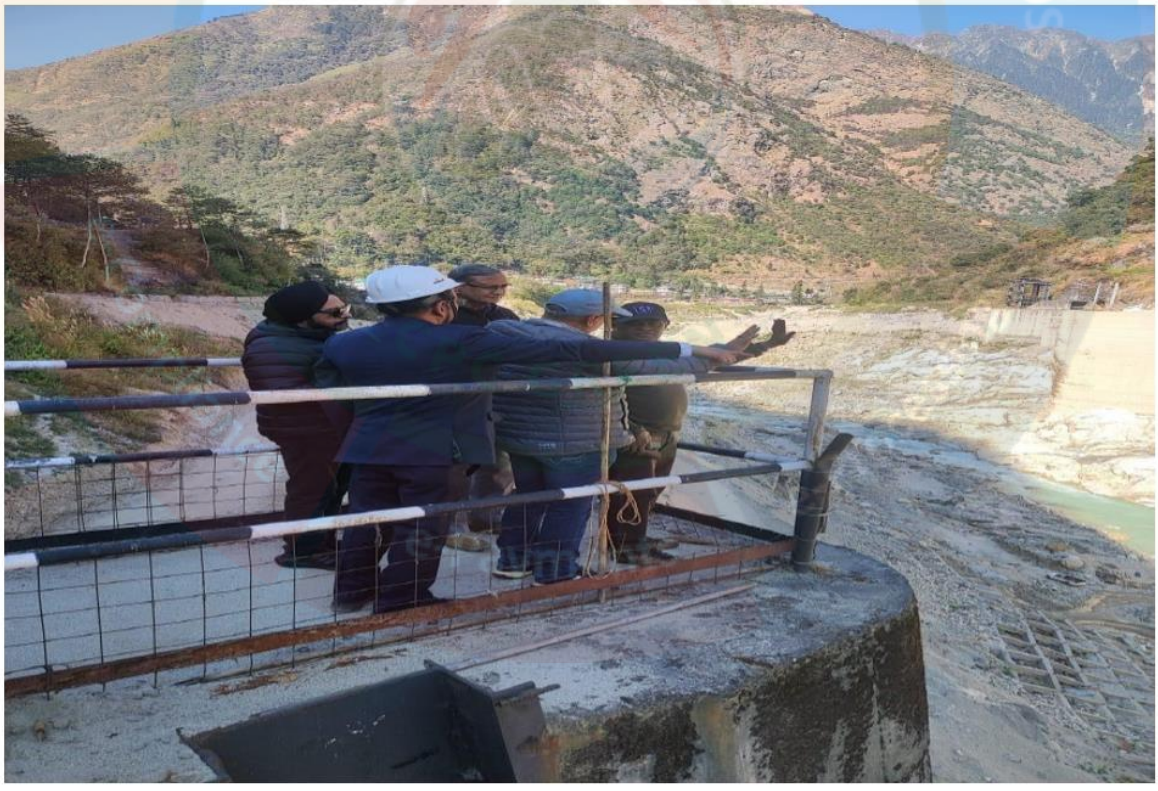

Fig: Location of proposed dam site.

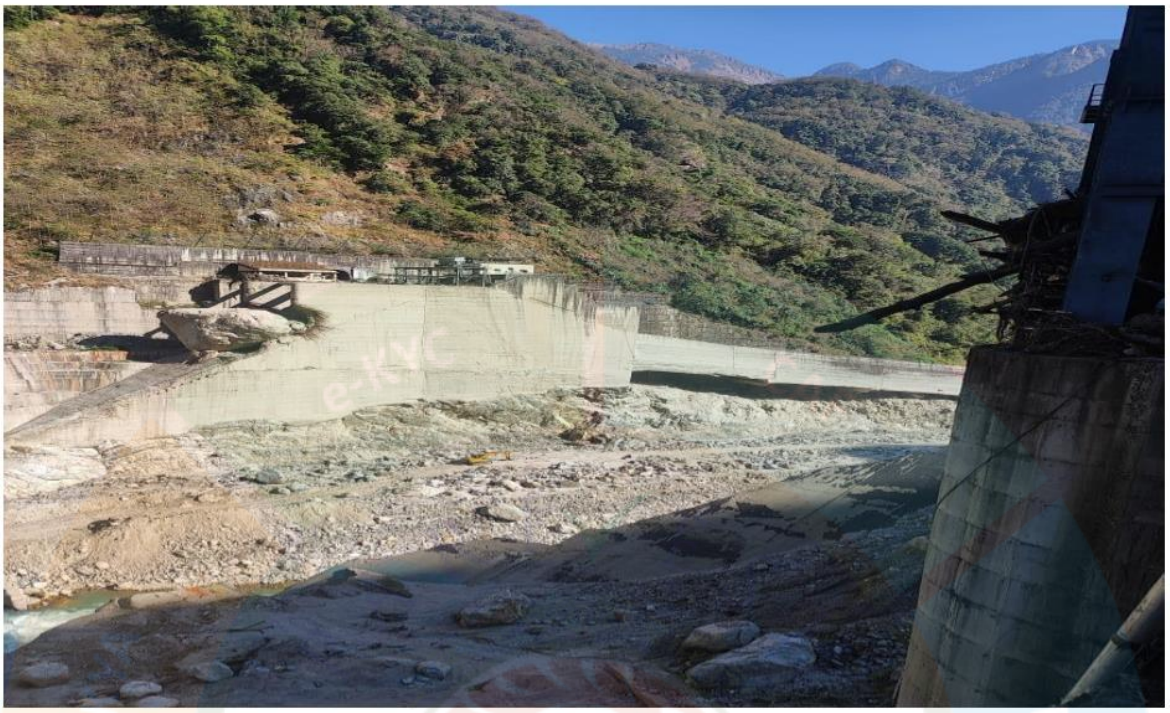

Fig: Remnant of washed away CFRD

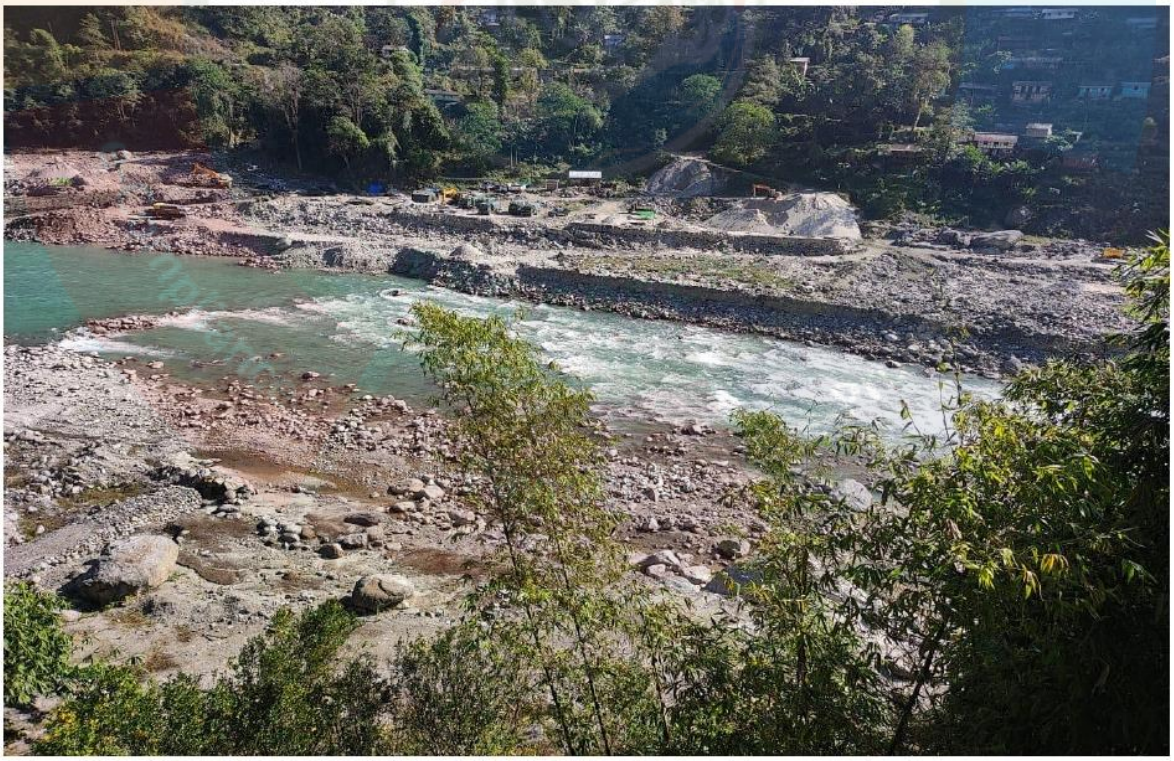

Fig: Army camp upstream of dam site

Approval of the Chairman– For Site Visit Report

Re: Draft site visit report of the sub-committee of EAC to 1200 MW Teesta Stage III HE Project, Sikkim by Sikkim Urja Limited (SUL) located at North District, Sikkim-reg.

CG Chakrapani GovindaJoseph <govind.chakrapani@es.iitr.ac.in>
Tue, 31 Dec 2024 6:58:32 AM +0530

To "Yogendra Pal Singh" <yogendra78@nic.in>

Cc "Rajeev Varshney" <rvarshney.cea@gov.in>, "lalitmeena-cwc" <lalitmeena-cwc@gov.in>, "Dr Krishnendu Mondal" <krishnendu.mondal@gov.in>, "sourabh.9 sourabh.9" <sourabh.9@govcontractor.in>

Good morning.
The visit report is well documented.
Please put this site visit and any other visit report for discussion under any other agenda item in today's meeting.
Good day.
Chakrapani

On 30-Dec-2024 21:54, Yogendra Pal Singh <yogendra78@nic.in> wrote:

Dear Sir,

Please find attached the draft site visit report of the EAC sub committee of above mentioned project for perusal and comments, if any.

With Regards,

Yogendra Pal Singh
Scientist 'E'
M/o Environment, Forest and Climate Change
Government of India
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Tele-fax: 011-20819364

Approval of the Chairman

Re: Draft MOM of the 21st EAC (RVHEP) meeting held on 31.12.2024-reg.

cg chakrapani govind <chakrapani.govind@gmail.com>
Thu, 09 Jan 2025 2:00:09 PM +0530 •

To "Yogendra Pal Singh" <yogendra78@nic.in>

Cc "govind chakrapani" <govind.chakrapani@es.iitr.ac.in>

Approved.
G.J. Chakrapani

On Thu, 9 Jan, 2025, 13:54 Yogendra Pal Singh, <yogendra78@nic.in> wrote:
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