Ref: TPC/BHV/2025/PSP-54. **Date:** 26.11.2025

To

The Director- IA.III,

Ministry of Environment, Forest and Climate Change,

Regional Office (WCZ),

Ground Floor East Wing,

New Secretariat Building, Civil Line,

Nagpur- 440001.

Sub: Bhivpuri Off Stream Open Loop Pumped Storage Project (1000 MW) – Submission of Half Yearly (Six Monthly) Compliance Report for the period of April 2025- Sept 2025 (1st December)
Ref: Environment Clearance letter no J-12011/39/2023-IA.I (R) dated 19/05/2025.

Dear Sir,

Environment Clearance was accorded to Bhivpuri Off Stream Open Loop Pumped Storage Project (1000 MW) with reference to above cited letter. We are here by submitting Half yearly EC Compliance report for the period of April 2025- Sept 2025 (1st December) as per EIA Notification of 2006 on Parivesh Portal.

Project Details

Bhivpuri Off-Stream Open Loop Pumped Storage Project (1000 MW)

Bhivpuri Open Loop Pumped Storage Project (1000 MW) in an area of 117.41Ha in Village Sawale, Khand and Bhivpuri (camp), Sub District Mawal and Karjat, District Pune and Raigarh, Maharashtra by M/s The Tata Power Co. Ltd. – Environmental Clearance (EC)

S No.		
1	**EC Identification No.**	EC Identification No.
2	**File No.**	J-12011/39/2023-IA.I (R)
3	**Clearance Type**	Fresh EC
4	**Category**	A
5	**Project/Activity Included Schedule No.**	1(c) River Valley/Irrigation projects
6	**Sector**	River Valley and Hydroelectric Projects
7	**Name of Project**	Bhivpuri Off-Stream Open Loop Pumped Storage Project (1000 MW)
8	**Name of Company/Organization**	The Tata Power Co. Ltd.
9	**Location of Project (District, State)**	RAIGAD, MAHARASHTRA
10	**Issuing Authority**	MoEF&CC
11	**Applicability of General Conditions as per EIA Notification, 2006**	No

TATA

Compliance of stipulated conditions of Environmental Clearance

1	**Specific EC Conditions for (River Valley/irrigation Projects)**	
S. No	**EC Conditions**	**Response**
1.1	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.	The dumping yards are being developed according to the prescribed procedures. A toe wall will also be suitably constructed. The excavated muck is currently being disposed of, and low-lying areas within the premises are being filled with this material.
1.2	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.	Filling of low-lying areas within the premises is ongoing in a manner that safeguards against contamination of natural streams and water bodies in the vicinity. Once disposal of the muck is completed, the site will be restored using local plant species. Please Refer **Annexure 1** – Approved Muck Management Plan
1.3	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.	Water sprinkling arrangements are being implemented during the dry season to mitigate dust emissions and maintain air quality. Please Refer **Annexure 2** – Photographs of Dust Mitigation Measures
1.4	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.	Tata Power is Committed to Zero Waste to landfill. Solid waste especially plastic waste generated at site is disposed off through authorized vendor and not disposed of as landfill material. Use of single-use plastic is discouraged at site.
1.5	Muck disposal sites be decided in view of provisions of the Western Ghats Notification dated 06.07.2022.	Muck disposal sites are decided in view of provisions of the draft Western Ghats Notification dated 06.07. 2022.The same is approved in line with EIA.
2	**Socio-economic**	
2.1	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.	Total private land is being purchased through private negotiations for the Bhivpuri Open-Loop Off-Stream Pumped Storage Project is well within the prescribed limits as specified in the provisions of RFCTLARR, 2013 hence Rehabilitation and Resettlement is not applicable for the Project.
2.2	RO plant shall be installed in the nearby 5 villages and the maintenance shall be done by the project Authorities	Water Filtration plant for Bhivpuri Gram Panchayat has been provided by Tata Power.
2.3	Solar panel be provided to the families living in rural areas within 10 km radius of project.	Provision of solar streetlights and high-mast lights will be prioritized for communities based on the findings of the community needs assessment.

2.4	School up to 12th Standard, equipped with solar power and smart classes, shall be established to provide quality education for free education to children's from project affected villages/Tribal villages.	To provide quality education for children around project area initiatives like digital learning boards, e-learning software, a science centre, a Learning on Wheels unit, and mentoring programs are being implemented.
2.5	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.	Being Complied Noted
2.6	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.	To address the health needs of the tribal population around the project area, the flagship Arogya Project is being implemented. Under this initiative, regular health camps will be organized, and non-chronic medication support will be provided. Additionally, a dedicated dispensary will be established in the Bhivpuri catchment villages.
2.7	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.	To provide regular skill-development training for youth in the project area, dedicated training camps will be conducted. In addition, Tata Power's Skill Development Institute (TPSDI)—an approved training partner of NSDC and a Dual Recognized Awarding Body under the National Council for Vocational Education and Training (NCVET)—will be leveraged.
2.8	The area is ecologically fragile therefore Project Proponent shall ensure that safety measures as mentioned in the EMP shall be fully implemented.	Tata Power is ensuring that safety measures as mentioned in the EMP will be implemented.
3	**Miscellaneous:**	
3.1	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.	After 5 years of the commissioning of the project, Tata Power will engage an independent agency to conduct a comprehensive study to assess the project's environmental impact
3.2	Bio-Gas plant shall be installed in the Project affected area for Utilizing Cattle waste (Cow Dung) into renewable source of fuel.	Noted
3.3	PP should establish in house (at project site) environment laboratory for measurement of environment parameter with respect to air quality and water (surface and ground). A dedicated team to oversee environment management shall be setup which should comprise of Environment Engineers, Laboratory	Regarding establishing inhouse Environment Monitoring Laboratory, considering the nature of the Project and the resultant pollution caused by the construction activity presently it is considered that environmental monitoring is being conducted by NABL and QCI accredited third parties. Dedicated environmental team has been established at the site, consisting of qualified members overseeing Environment Management at site

	chemist and staff for monitoring of air, water quality parameters on routine basis.	
3.4	PP shall procure construction material only from those Organizations having all valid legal/statutory clearances/permissions or necessary permission to be obtained for quarrying construction materials for the project as per the EIA Notification, 2006 and as amended thereof.	Tata Power is procuring construction material from Organizations having valid legal/ Statutory clearances for quarrying construction materials for the project as per the EIA Notification, 2006 and as amended thereof. Refer **Annexure 3** for sample consent of vendor
3.5	An institutional mechanism to be developed to ensure the preference of jobs to PAFs and also a policy for preferential treatment for award of sundry works to the PAFs and their dependents	There are no Project Affected Families (PAFs) hence no preferential employment policy is applicable; however, local individuals are preferred based on their skills.
4	**Environmental Management And Biodiversity Conservation**	
4.1	The water of rainfall yield of self-catchment of the reservoir shall be released to downstream through body of dam/ barrage/ embankment etc.	Tata Power will release water of rainfall yield of self-catchment of the Lower reservoir to downstream through body of dam/ barrage/ embankment etc.
4.2	The water for filling of reservoir/ recoupment of evaporation and recirculation losses shall be met from a source other than the rainfall yield of catchment of non-perennial stream/ nallah.	Water towards initial one-time filling and 0.5 MCM towards recoupment of evaporation losses will also to be drawn from the Thokarwadi reservoir for operation of proposed Bhivpuri PSP (1000 MW).
4.3	The Environmental Management Plan (EMP) shall be strictly adhered to as submitted in the EIA/EMP reports. The budgetary provisions for implementation of EMP, shall be fully utilized and not to be diverted to any other purpose. In case of revision of the project cost or due to price level change, the cost of EMP shall also be updated proportionately.	The Environmental Management Plan (EMP) is prepared and shall be strictly adhered to as submitted in the EIA/EMP reports. An EMP cost has been earmarked towards implementation of environment management plan.
4.4	The contract clause limiting the No. of vehicles used during excavation and transportation shall followed scrupulously and the same shall informed to the ministry.	Noted
4.5	Ambient Air Quality Monitoring Stations for real time data to be installed at project site before commencement of the construction, shall be displayed at project site and its report to be submitted to IRO, MoEF&CC.	Periodic Environment Parameter monitoring is being done.
4.6	No vehicle purchase shall be allowed from funds earmarked for implementation of	Noted

	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.	
4.7	10000 plants shall be planted around the muck disposal area and the survival of plants shall be submitted with the 6 monthly compliance report.	Once muck disposal sites are stabilized, plantation will be carried out around muck disposal area.
4.8	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.	Watershed Development Plan of Bhivpuri PSP has been prepared by Department of Water Resources Development & Management, Indian Institute of Technology. Please Refer **Annexure 4-** Water Shed Development report by IIT Roorkee
4.9	Miyavaki Forest shall be developed within 10 km radius of the project.	Miyawaki Plantation project is being developed by Tata Power at suitable land identified.
4.10	Safeguard conditions mentioned in the Western Ghats Notification S.O. 3072(E) dated 06.07.2022 be complied with.	All safeguard conditions stipulated in the draft Western Ghats Notification S.O. 3072(E) dated 06.07.2022 are strictly being complied with during the construction phase of the project
4.11	Community radio shall be established.	
4.12	Relocation of trees will be attempted strictly in consultation with Forest Department.	Relocation of trees is attempted strictly in consultation with Forest Department
	Standard EC Conditions for (River Valley/Irrigation projects)	
1	**Statutory Compliance**	
1.1	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.	Bhivpuri PSP has received Stage I forest clearance vide letter FP/MH/HYD/IRRIG/447097/2023 dated 12.05.2025. Please refer **Annexure 5** for Stage I Forest Clearance.
1.2	The project proponent shall obtain clearance from the National Board for Wildlife, if applicable.	Bhivpuri PSP does not fall in any protected areas like Wildlife Sanctuary/National Parks etc. there is no Sanctuary, National Park or Tiger Trail within 10 Km of project area. Nearest protected area from project area is Bhimashankar Wildlife Sanctuary, at arial distance of 10.37 Km. therefore said proposal does not require Wildlife approval. Please Refer the **Annexure 6** - Approval for Biodiversity and Wildlife conservation plan from PCCF (Maharashtra) mentioning no clearance required from NBW.
1.3	The project proponent shall prepare a Site-Specific Conservation Plan & Wildlife Management Plan and approved by the Chief Wildlife Warden. The	Schedule-I Specie Conservation Plan approval letter from State Forest Department. Please Refer the **Annexure 6** Approval for Biodiversity and Wildlife

	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).	conservation plan from PCCF (Maharashtra) mentioning no clearance required from NBW.
1.4	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.	The consent to establish is granted for Bhivpuri PSP dated 13.01.25. Please Refer **Annexure 7** – MPCB Consent to Establish
1.5	NOC shall be obtained from National Commission of Seismic Design Parameters (NCSDS) of CWC	NOC is received from National Commission of Seismic Design Parameters (NCSDP) of CWC. Please Refer **Annexure 8** –Approval document.
1.6	Necessary approval of CEA shall be obtained for those projects having the project cost more than Rs. 1,000 crores.	All necessary approvals from CEA are in place Please Refer **Annexure 9** – CEA Approval document.
2	**Air Quality Monitoring And Preservation**	
2.1	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.	Regular monitoring of various environmental parameters as per the CPCB guidelines at designated locations will 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. Please Refer **Annexure 10** - Third party Quarterly monitoring reports.
2.2	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.	Necessary control measures like water sprinkling to control dust, water Gun machines have been installed to further reduce dust levels. Please Refer **Annexure 11-** Photos of APC at site
2.3	Necessary control measures such as water sprinkling arrangements, etc. bet taken up to arrest fugitive dust at all the construction sites.	Necessary control measures like water sprinkling to control dust, water Gun machines have been installed to further reduce dust levels. Refer **Annexure 12** for Water Sprinkling arrangement at site
2.4	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).	This condition is not applicable since project is PSP

2.5	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).	This condition Not applicable
2.6	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.	Once project is commissioned, Before impounding of the water, Cofferdams for both at the upstream and downstream will be decommissioned as mentioned in EIA/EMP report So that Cofferdam should not create any adverse impact on water environment.
2.7	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.	Not Applicable, as the project is an Off-Stream Pumped Storage Project and not a run-off river project.
2.8	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.	Not Applicable, as the project is an Off-Stream Pumped Storage Project and not a run-off river project.
2.9	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).	Training programs on efficient irrigation techniques and water management practices in the villages will be organized as a implimentation measure for Water Shed development plan
2.10	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).	This condition is not applicable since project is PSP
3.	**Noise Monitoring And Prevention**	
3.1	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	All the equipment generating high noise are appropriately enclosed so as to meet the ambient noise standards as notified under the Noise Pollution (Regulation and Control) Rules, 2000, as amended in

	(Regulation and Control) Rules, 2000, as amended in 2010 under the Environment Protection Act (EPA), 1986.	2010 under the Environment Protection Act (EPA), 1986.
3.2	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.	The ambient noise levels 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. Refer **Annexure 10** for Noise monitoring reports
4	**Catchment Area Treatment Plan**	
4.1	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	Catchment Area Treatment (CAT) Plan is developed as a part of EMP and same will be implemented in consultation with the State Forest Department ; in sync with the construction of the project. Please Refer **Annexure 13**– CAT Plan.
5	**Waste Management**	
5.1	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.	Muck disposal is being carried out only in the approved and earmarked sites. Generated Muck is used internally for construction and other filling purposes and balanced will disposed of at the designated disposal sites. Once the muck disposal is complete, proper treatment measures as mentioned in EMP (Engineering and biological measures) will be carried out for site stabilization.
5.2	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.	Solid waste management plan is being developed. Efforts be made to avoid one time use of plastics at site
6	**Green Belt And Wildlife Management**	
6.1	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.	Not Applicable, as the project is an Off-Stream Pumped Storage Project and not a run-off river project.
6.2	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	While conducting EIA, For the documentation of fish fauna in the project area, experimental fishing was carried out in Andhra and Indrayani River. Fish fauna has been recorded from Thokarwadi reservoir as well as the river.

	river itself for which adequate budget provision be made and followed strictly.	
6.3	Wildlife Conservation Plan approved by the Chief Wildlife Warden shall be implemented in consultation with the local State Forest Department.	Detailed Wildlife Conservation Plan approved by the Chief Wildlife Warden will be implemented in consultation with the local State Forest Department.
6.4	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.	To enrich the habitat of the project site, plantation shall be raised as envisaged in the EIA/EMP report.
6.5	Compensatory afforestation programme shall be implemented as per the plan approved.	Compensatory afforestation programme is being implemented as per the plan approved.
6.6	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.	Not Applicable, as the project is an Off-Stream Pumped Storage Project and not a run-off river project.
7	**Public Hearing And Human Health Issues**	
7.1	Resettlement & Rehabilitation plan be implemented in consultation with the State Govt. as approved by the State Govt.	The entire private land identified for the project falls in Khand and Sawale revenue villages of Mawal Tehsil of Pune District of Maharashtra. None of them is getting displaced due to the project from the above land procurement. Hence Resettlement & Rehabilitation plan is not required
7.2	Budget provisions made for the community and social development plan including community welfare schemes shall be implemented in toto.	Budget provisions made for the community and social development plan including community welfare schemes are being implemented.
7.3	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.	After commissioning of labor colony Fuming & spraying of mosquito control and fuming in the camp office, labour colonies and stagnated pools
7.4	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.	Provision for housing of construction labour with all necessary infrastructure and facilities such as fuel for cooking, mobile toilets, mobile STP, safe drinking water, medical health care, creche etc. is being provided. The housing being temporary will be removed after the completion of the project.

7.3	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.	Labour force being engaged for construction works is being examined thoroughly and adequately treated if required before issuing them work permit. Dedicated and equipped medical centre is established for site
8	**Risk Mitigation And Disaster Management**	
8.1	Early Warning Telemetric system shall be installed in the upper catchment area of the project for advance intimation of flood forecast.	As this project is pumped storage project and is not located at any river course, so the early warning telemetric system is not envisaged.
8.2	Drilling and blasting shall be done only either by licensed explosive agent or by the proponent after obtaining required approvals from Competent Authorities	Drilling and blasting are done by licensed explosive agent after obtaining required approvals from respective DC. Additionally, each blast is being monitored by CWPRS (The Central Water and Power Research Station) & CIMFR (Central Institute of Mining and Fuel Research) Refer **Annexure 14** for Blasting permission.
8.3	Emergency preparedness plan be made for any eventuality of the dam failure and shall be implemented as per the Disaster Management Plan.	Emergency preparedness plan is developed as a part of EMP
8.4	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.	Once muck disposal is complete, Stabilization of muck disposal sites using measures as mentioned in EMP (biological and engineering measures) will be taken up to ensure that muck does not roll down the slopes and does not pollute the natural streams and water bodies in surrounding area.
8.5	Catchment area treatment plan shall be prepared and sufficient fund shall be provided for afforestation, rim plantation, pasture development, nursery development.	Catchment area treatment plan is developed as a part of EMP ion, rim plantation, pasture development, nursery development. Please Refer the **Annexure 13** – CAT Plan.
9	**Corporate Environment Responsibility**	
9.1	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.	Tata Power will 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.
9.2	Skill mapping be undertaken for the youths of the affected project area and based on the skill mapping, necessary	Skill mapping will be undertaken for the youths of the affected project area and based on the skill

	trainings to the youths be provided for their long-time livelihood generation	mapping, necessary trainings to the youths be provided for their long-time livelihood generation.
9.3	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.	Tata Power has a Board-approved Environment Policy, supported by a formal commitment document. The policy outlines organizational responsibilities and governance for environmental management. The document is available on the company's website under Company Resource Center. Website link: www.tatapower.com. Please refer **Annexure 15** for Tata Power's Environment Policy
9.4	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.	A separate Environmental Cell with qualified Environment Professionals is established both at the project and company head quarter level. Environment department reports to senior Executive, who directly reports to the top management of the organization.
9.5	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.	Detailed EMP is prepared along with responsibility matrix. The same is included in EIA. Year wise progress report will be submitted to Ministry/Regional Office along with the Six-Monthly Compliance Report.
9.6	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.	After five years of commissioning of the project, EIA and SIA will be prepared through a third party and evaluation report be submitted to the Ministry.
9.7	Multi Disciplinary Committee (MDC) be constituted with experts from Ecology. Forestry, Wildlife, Sociology. Soil	A process for formation of MDC will be initiated considering experts from Ecology, Construction

	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.	Engineering and Environment to closely overview EMP implementation.
9.8	Formation of Water User Association/Co-operative be made involvement of the whole community be ensured for discipline use of available water for irrigation purposes	Noted
10	**Miscellaneous**	
10.1	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.	Environment Clearance is updated at Tata Power website for display. Advertisement regarding grant of EC for project was published in Marathi News Papers: Dainik Krushival Raigad Times ,Loksatta (Pune) and English News Paper Indian Express (Mumbai) and Indian Express (Pune) on 23.05.25. Please Refer **Annexure 16**– Environment Clearance Advertisement Copy.
10. 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.	The copies of the environmental clearance are submitted to the Heads of local bodies, Panchayats and Municipal Bodies in addition to the relevant offices of the Government. Please Refer **Annexure 17**– Environment Clearance Submission acknowledgement Copy.
10.3	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.	Status of compliance of the stipulated environment clearance conditions, will be displayed on Tata Power's website and updated the same on half-yearly basis.
10.4	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.	Noted
10.5	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	Noted

	(Protection) Rules, 1986, as amended subsequently and put on the website of the company.	
10.6	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.	Noted. The date of financial closure and final approval of the project will be informed to the Regional Office as well as the Ministry by Tata Power
10.7	The project authorities must strictly adhere to the stipulations made by the State Pollution Control Board and the State Government.	Tata Power will strictly adhere to the stipulations made by the State Pollution Control Board and the State Government.
10.8	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.	Tata Power will abide by all the commitments and recommendations made in the EIA/EMP report, commitment made during Public Hearing and Expert Appraisal Committee.
10.9	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).	Tata Power will not consider expansion or modifications in the plant without prior approval of the Ministry of Environment, Forests and Climate Change (MoEF&CC).
10.10	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.	Tata Power will not Conceal factual data or submit false/fabricated data that may result in revocation of this environmental clearance and attract action under the provisions of Environment (Protection) Act, 1986.
10.11	The Ministry may revoke or suspend the clearance, if implementation of any of the above conditions is not satisfactory.	Noted
10.12	The Ministry reserves the right to stipulate additional conditions if found necessary. The Company in a time bound manner shall implement these conditions.	Noted
10.13	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.	Noted
10.14	The above conditions shall be enforced, inter-alia under the provisions of the Water (Prevention & Control of Pollution)	Noted

	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.	
10.15	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.	Noted

Regards,

Kumar Pritam 26/11/25

(Chief – Hydro Projects)

Enclosed: All the annexures.

Section 10.6

MUCK MANGEMENT PLAN

10.6 MUCK MANAGEMENT PLAN

The muck generated from various project activities during the construction of the PSP may adversely affect the environment if not properly managed. The generated muck volume, if not properly disposed, can destroy the landscape and increase the atmospheric particulate matter. The proposed project Bhivpuri PSP (1000 MW) consists of utilising the Existing Thokarwadi Reservoir in Mawal Taluka of Pune District as upper reservoir powerhouse is in Karjat Taluka of Raigad District of Maharashtra State. Project involves construction of new lower Reservoir near Humgaon village, Karjat taluka, Raigad district in Maharashtra state along with other project components.

The proposed is likely to generate large volume of muck of which some quantity will be utilizable, and the remaining muck volume needs to be rehabilitated at appropriate dumping sites in a technically and ecologically sound manner. Map showing location of Muck dumping site is given in **Figure 10.6**.

10.6.1 Quantity of Material to be Excavated

The construction activities of the project would generate muck from excavation of various project structures. The total quantity of 50,07,191 Cum (8,55,965 Cum soil and 41,51,226 Cum rock) muck is likely to be generated from excavation for various components. The component-wise quantity of muck to be generated and quantity of muck to be disposed are given at **Table 10.15**.

However, after the utilization of muck (bout 30.0 lakh cum) for different project components, the total quantity after considering swelling factor of muck to be disposed of works out to 27,84,642 cum. The entire excavated material is proposed to be dumped at 5 pre-identified dumping sites over a combined area of **41.0 ha** area with a total capacity of 44,00,000 cum muck to be accommodated. Location of pre-identified site which has been identified specifically for this purpose as shown in **Figure 10.6**.

Table 10.15: Muck to be generated from various components of the project

S. No.	Component	Quantity in Cum	
		Soil	Rock
1	Coffer Dam	67,657	28,996
2	Lower Reservoir	5,34,873	21,39,491
3	Pressure Tunnel	2,498	47,455
4	Tail race tunnel	1,338	25,422
5	Buried Penstock	38,250	2,16,752
6	Head Race Tunnel	9,367	1,77,973
7	Adits & Adit Portals	6,940	39,328
8	Surge Shaft	10,602	42,409
9	Powerhouse	47,416	9,00,905
10	Lower & Upper Intake	1,18,688	4,74,753
11	Cable Tunnel	371	3,337
12	Butterfly Valve Chamber	7,494	29,975
13	Pithead Yard	10,470	24,431
Total		**8,55,965**	**41,51,226**

S. No.	Component	Quantity in Cum	
		Soil	Rock
Excavated material to be used for rockfill and aggregate		5,13,579	24,90,736
Balance quantity of Muck to be dumped		3,42,386	16,60,490
Swell Factor		0.83	0.70
Balance quantity of Muck to be dumped		4,12,513	23,72,129
Total quantity of Muck to be dumped			27,84,642

10.6.2 Muck Disposal Site

Keeping the above requirement and vicinity of the excavation sites in view, excavated muck is to be dumped in pre-identified 5 disposal sites with a total area of about 41.0 ha and capacity has been worked as 33,73,000 cum (**Table 10.16**). The disposal site was identified taking into consideration availability of suitable area, minimum distance from generation sites.

Table 10.16: Muck to be generated from various components of the project

Dumping site	Area in m²	Capacity of Dumping Site (cum)
Dumping Area 1-North of Lower Reservoir	36,000	4,32,000
Dumping Area 2: East of Lower Reservoir	64,000	4,00,000
Dumping Area 3: South of Lower Reservoir	31,500	3,16,000
Dumping Area 4: South of Lower Reservoir	28,500	3,25,000
Dumping Area 5: South of Lower Reservoir	2,50,000	19,00,000
Total	**410,000**	**33,73,000**

10.6.2.1. Criteria for Selection of Dumping Site

The following points were considered and followed as guidelines for finalization of the areas to be used as dumping sites:

i) The dumping sites have been selected as close as possible to the project area to avoid long-distance transport of muck.
ii) The site is free from any landslides or creep and care has been taken that the sites do not have a possibility of toe erosion and slope instability.
iv) There is no active channel or stream flowing through the dumping sites.
v) The site is away from human settlement areas.

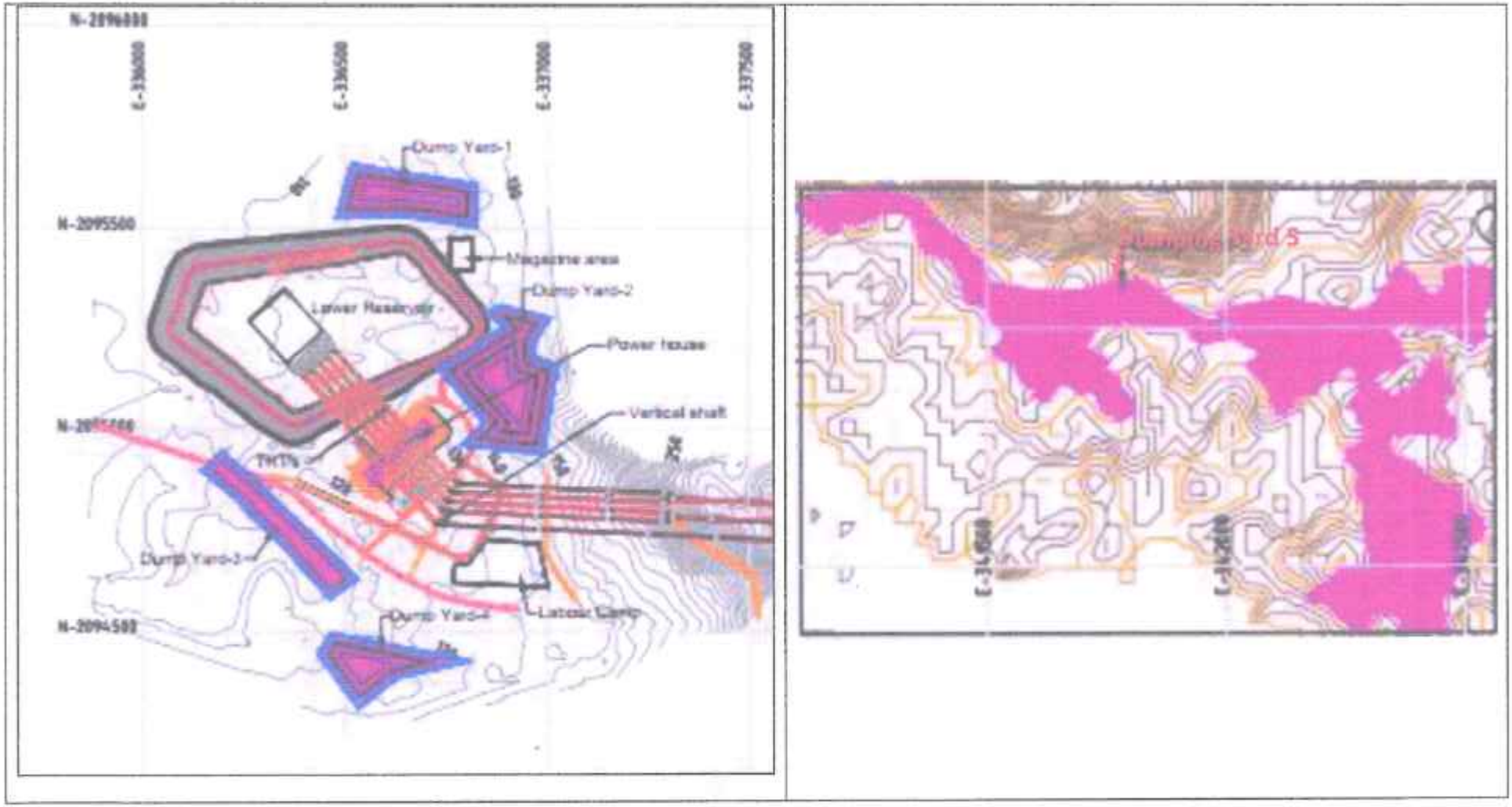
The identification of muck disposal areas was done in line with the topographic and site-specific conditions as specified above.

10.6.2.2. Methodology of Dumping

The muck that needs disposal would be piled at Ø (angle of repose) maximum of 30° at the proposed dumping site. The description regarding the stabilization of the stacked material along the proposed roads has been discussed in the following paragraphs.

The options like dumping muck in stages and allowing it to consolidate/settle through the monsoon, compacting the dumped muck with Bulldozer movement, zoning of the dump judiciously to ensure the stability of 30° slope under all superimposed conditions will be explored and utilized. The main objectives of process of muck dumping and restoration of these muck disposal sites are:

- to protect and control soil erosion;
- to create greenery in the muck disposal area;



a. Muck Disposal Sites located near Lower reservoir

b. Muck Disposal Sites located near Upper reservoir

Figure 10.6: Layout Map Showing Location of Muck Dumping Sites

- to improve and develop the sites into recreational site;
- to ensure maximum utilization of muck for the construction purpose;
- to develop the muck disposal site/ dumping yard to blend with the surrounding landscape.
- to minimize damages due to the spoilage of muck in the project area.

In Bhivpuri PSP, a scientific approach and methodology was followed for identification of the dumping site. All possible alternate sites were inspected and examined before rejecting or selecting any site. The dumping site is characterized by:

i) low vegetation cover,
ii) the populated /settlement areas are away from the dumping site and therefore will have least impact on human settlements, and
iii) the identified muck site is close to the area of generation to avoid hazards related to transport of muck for long distances and minimizing traffic problems.
iv) the identified muck sites are close to the sites from where muck is to be generated to avoid hazards related to transport of muck to long distances.

a) Dumping Process

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.

A retaining wall has been proposed to hold the muck on the lower part of the dumping site and shall be constructed prior to dumping of muck. Loose muck would be compacted layer-wise. The height of Gabion Wall is proposed to be 6m on average. The muck brought by dumpers will be spread in layers behind the wire crate walls and then compacted by rollers till the top level is achieved. The retaining wall shall be laid with proper berm and the muck dumped behind it in layers and compacted by rollers. The process shall be repeated up to 50 cm level below the desired height which shall be laid with good soil for providing grass cover. At a regular vertical interval of 1.5 m and 3.0 m c/c masonry drains (catch water drains) shall be provided to drain off the rainwater. Proper fencing of the entire area will be done.

The muck disposal area will ultimately be covered with fertile soil and suitable plants will be planted adopting suitable bio-technological measures. The project authorities would ensure that the dumping yards blend with the natural landscape by developing the site with gentle slope, patches of greenery in and around them. These sites can also be developed later as recreational parks and tourist spots with sufficient greenery by planting trees.

The Rehabilitation plan of muck dumping sites includes engineering and biological measures. Most of the total unused excavated muck would be placed at an angle of repose to avoid any slippage of the muck at the proposed dumping sites. Slopes would be broken up by creating benches across the slope. This will be done to provide stability to the slopes and also to

provide ample space for planting trees which would further help in holding and consolidating the material stacked at different sites. As stated earlier, efforts will be made to dispose of the muck within short distances from sites of its generation.

The capacity/volume of the muck dumping sites is more than the volume of the muck to be disposed. All measures would be adopted to ensure that the dumping of muck does not cause injury or inconvenience to the people or the property around the area. The spillage of muck into the river at any site would be prevented by making concrete retaining walls to retain the muck pile. It shall be ensured that dumping is carried out at a minimum distance of 30 m away from the active riverbank. The top surface would be levelled and graded after the capacity of any dumping site is exhausted. The top surface will be covered with soil and grass seeding will be ensured to promote vegetation cover.

10.6.3 Rehabilitation of Muck Disposal Site

The Rehabilitation plan of muck dumping site includes engineering and biological measures. The project authorities would ensure that the dumping yards blend with the natural landscape to develop the site with patches of greenery in and around it. The site can also be developed later as a recreational park or any other purpose with sufficient greenery by planting ornamental plants. The muck dumping site would be developed as Eco-Park which would not only help in rehabilitation of disposed muck site but also help in propagating biodiversity conservations measures. The following engineering and biological measures have been proposed for the development of spoiled areas.

10.6.3.1. Engineering Measures

For stacking of dumped material, and mainly to avoid spillage of muck beyond the acquired boundary of muck disposal area, RR masonry retaining wall is proposed to be built before dumping of any material on the site.

The methodology consists in developing the formation width is half cutting and half filling, so that the materials obtained from cutting are utilized in filling. The excavation on the hill side will be done to get a stable slope for the materials encountered. At places breast wall, gabion walls shall be done in natural slope to retain filled material, particularly where there is problem of retaining the slope.

i) **Retaining Wall:** Total area of land for dumping of muck is 41.0 ha i.e., which can accommodate about 44.0 lakh cum. Considering the topographical condition of site provision of retaining wall has been made around the proposed muck disposal sites. The retaining wall shall have RCC base of 100mm thick and a width of about 3.0 m. The masonry wall is proposed with weeping pipes with PVC pipes of 100mm for drainage. The leveling & Sloping would be done after dumping the material after every cycle and simultaneously improving the drainage of the disposal site.

ii) **Compaction and Levelling:** Compaction is an engineering measure, which would reduce bulk density of the muck thereby optimizing the use of muck disposal area and would make it suitable for the plantation and other biological measures. The top surface would be levelled and graded to make the alternative use. The muck will be spread in layers of 500-700 mm thick layers. Top surface would be levelled and graded to make the alternative use. On top a

layer of soil would be spread to make the land suitable for plantation. The total cost for the process of compaction is **Rs. 350.00 lakh**.

iii) **Fencing:** Fencing is a bio-engineering measure. After rehabilitation of muck the dumping area need protection for some time from disturbing by human and domestic animals. For this reason, fencing around the muck deposited is required. Barbed wire strands with two diagonal strands, clamped to wooden/ concrete posts placed at 3 m distance are proposed around the dumping piles. Project authorities will establish temporary wind barriers around 3 sides of dumps close to the settlements.

The muck is proposed to be filled in layers properly compacted. The estimated cost for the engineering measures has been given in **Table 10.17**. In addition, catch water drains are also proposed to be built and levelling of soil would also be done after dumping the material on every cycle and simultaneously improving the drainage of the disposal site. The estimated cost of engineering measures would be **Rs. 3206.37 lakh**.

Table 10.17: Estimated Cost of Engineering Measures

S. No.	Particular	Quantity	Unit Rate	Cost (In Lakh)
1	Earthwork for foundation (Cum)	20500	300	61.50
2	PCC 100 mm Thick M10 Grade Concrete (Cum)	6360	4500	286.20
3	R.R. Masonry (Cum)	63600	3500	2226.00
4	Weep Holes with PVC Pipe 100 mmØ @1.5m C/C Vertically & Horizontally	141333	200	282.67
5	Compacting and land levelling, etc.		LS	350.00
	Total cost (In Lakhs)			**3206.37**

10.6.2.3. Biological Measures

Top surface area of about 40.0 ha of muck dumping area will be restored and will be treated for the purpose of plantation. Vegetation cover controls the hydrological and mechanical effects on soils and slopes. Therefore, biological measures are essential to stabilize the loose slope and to control soil erosion. To implement the biological measures in dumping area the following activities would be considered. The biological measures include the following:

i) **Soil treatment:** Muck dumped at various sites is not considered to be nutrient rich, excavated muck from underground components generally lacks nutrients and therefore is difficult to re-vegetate. However, if no attempts to vegetate the slopes are made, the muck could slide lower down during rain and may eventually wash off. In order to make it suitable for the plantation it will be provided bio treatment. Bio-fertilizer technique developed by National Environmental Engineering Research Institute (NEERI) can be adopted in the proposed project.

The traditional methods of afforestation of these areas would be supplemented with the use of fungus, i.e. Vesicular Arbuscular Mycorrizae (VAM) and nitrogen fixing bacteria that form partnership with plant roots. The seeding of plants would be inoculated with VAM and nitrogen fixing bacteria before planting. It has been found that plants inoculated with bio-fertilizers grow at faster rate especially in the medium where the soil/rock is devoid of nutrients.

ii) **Plantation:** The plantation of indigenous plant species of high ecological and economic value which can adapt to local habitat will be undertaken with 550-600 plants per hectare depending upon the canopy cover required. Major tree species which would be planted are listed in **Table 10.18** below.

The muck dumping site would be developed as Eco-Park which would not only help in rehabilitation of disposed muck site but also help in propagating biodiversity conservations measures. The landscaping and restoration plan for development of Eco-Park and green belt over restored muck dumping sites will be implemented with help of landscaping experts and in consultation with State Horticulture Department as well as concerned Forest Division

The dumping areas are very small; therefore, a separate nursery would not be required. Saplings for plantation should be procured from existing forest department nursery. Nearly 1-2 years old saplings would be used for the plantation. Grasses and herbaceous species would be used in the inter space of tree and shrub species. They will help in providing the continuous chain of support in retaining debris, reinforcing soil and increasing the infiltration capacity of the area. After the process of compaction dumping site will be available for the plantation. In consultation with the forest department as well as horticultural department.

Table 10.18: List of Plant species proposed to be planted on restored muck dumping sites

S. No.	Family	Scientific Name
1	Anacardiaceae	*Mangifera indica*
2	Anonaceae	*Polyalthia longifolia*
3	Apocynaceae	*Nerium indicum*
4	Combretaceae	*Anogeissus pendula*
5	Combretaceae	*Terminalia* sp.
6	Euphorbiaceae	*Jatropha curcas*
7	Fabaceae	*Acacia* sp.
8	Fabaceae	*Albizia sp.*
9	Fabaceae	*Cassia fistula*
10	Fabaceae	*Dalbergia* sp.
11	Fabaceae	*Bauhinia* sp.
12	Fabaceae	*Senna montana*
13	Lamiaceae	*Tectona grandis*
14	Magnoliaceae	*Magnolia champaca*
15	Malvaceae	*Bombax ceiba*
16	Meliaceae	*Azadirachta indica*
17	Meliaceae	*Toona ciliata*
18	Meliaceae	*Chukrasia tabularis*
19	Meliaceae	*Melia azedarach*
20	Moraceae	*Ficus* sp.
21	Myrtaceae	*Syzygium sp.*
22	Ochnaceae	*Ochna obtusata*
23	Rubiaceae	*Anthocephalus cadamba*
24	Rubiaceae	*Mitragyna parvifolia*
25	Rubiaceae	*Morinda pubescens*
26	Rutaceae	*Aegle marmelos*
27	Sapotaceae	*Madhuca indica*
28	Acanthaceae	*Justicia adhatoda*
29	Apocynaceae	*Nerium indicum*
30	Euphorbiaceae	*Jatropha curcas*
31	Poaceae	*Dendrocalamus strictus*
32	Sapindaceae	*Dodonaea viscosa*
33	Verbenaceae	*Vitex negundo*

The estimated cost of biological measures to restore the dumping sites would be **Rs. 193.25 lakh**. This cost includes the cost of turfing slopes, preparation of ground, spreading of manure, etc., providing 5 cm of soil cover and transportation and carriage. It also includes the cost of fencing, irrigation, watch and ward, etc. (**see Table 10.19**).

Table 10.19: Total financial outlay for the biological measures at dumping sites

S. No.	Particulars	Quantity (Ha)	Rate/ ha (in Rs.)	Amount (Rs. in lakh)
1	Site preparation (Levelling and spreading of fertile soil)	41	2,00,000	82.00
2	Block Plantation	41	1,25,000	51.25
3	Cost of RCC fence post and B/Wire around Plantation site		Lumpsum	25.00

S. No.	Particulars	Quantity (Ha)	Rate/ ha (in Rs.)	Amount (Rs. in lakh)
4	Misc. (watering, transport, etc.)	-	Lumpsum	20.00
5	Maintenance for 5 years	5	3,00,000	15.00
	Total			193.25

10.6.4 Financial Requirement

The estimated cost of the relocation and rehabilitation of excavated material is given in **Table 10.20**. The total cost of these measures will be **Rs. 3399.62 lakh.**

Table 10.20: Financial requirements for implementation of Muck Disposal Plan

S. No.	Item	Amount (Rs.in lakh)
1.	Engineering measures	3206.37
2.	Biological measures	193.25
	Total	**3399.62**

Abhjieet Patil
For, The Tata Power Co. Ltd.

Deputy Conservater of Forest
Pune Forest Division, Pune

Annexure 2: Dust Mitigation measures

MAHARASHTRA POLLUTION CONTROL BOARD

Tel: 022-27572620
Fax: 022-27562132
Website: http://mpcb.gov.in
Email: roraigad@mpcb.gov.in

Raigad Bhavan, 6th floor,
Sector - 11, C.B.D Belapur,
Navi Mumbai.

ORANGE/S.S.I (O90A)/ Rev. ORANGE/I.S./(36)
No:- Format1.0/RO/UAN
No.0000247846/CO/2507002892

Date: 23/07/2025

To,
M/s. Vaibhav Construction,
S. No. 1, Hissa No. 1A/2 Village- Tambas,
Tal- Karjat, Dist-Raigad

Your Service is Our Duty

Sub: **Grant of Consent to Operate under Orange Category.**

Ref:
1. Consent to Operate accorded by the Board vide SRO-Raigad-II/Consent/ 190600004 dtd. 01.06.2019 which was valid upto 31.05.2022.
2. Your application No.MPCB-CONSENT-0000247846 Dated 20.05.2025

Your application No.MPCB-CONSENT-0000247846 Dated 20.05.2025

For: grant of Consent to Operate under Section 26 of the Water (Prevention & Control of Pollution) Act, 1974 & under Section 21 of the Air (Prevention & Control of Pollution) Act, 1981 and Authorization under Rule 6 and Rule 18(7) of the Hazardous & Other Wastes (Management & Transboundary Movement) Rules 2016 is considered and the consent is hereby granted subject to the following terms and conditions and as detailed in the schedule I, II, III & IV annexed to this order:

1. **The consent to operate is granted for a period up to 31/05/2029**
2. **The capital investment of the project is Rs.3.53 Crs. (As per C.A Certificate submitted by industry)**
3. **Consent is valid for the manufacture of:**

Sr No	Product	Maximum Quantity	UOM
Products			
1	Ready Mix Concrete (Captive Purpose only)	30	m3/hr

4. **Conditions under Water (P&CP), 1974 Act for discharge of effluent:**

Sr No	Description	Permitted (in CMD)	Standards to	Disposal Path
1.	Trade effluent	1.0	As per Schedule-I	Recycle 100% to achieve ZLD
2.	Domestic effluent	1.0	As per Schedule-I	Soaked in soak pit

5. **Conditions under Air (P& CP) Act, 1981 for air emissions:**

Sr No.	Stack No.	Description of stack / source	Number of Stack	Standards to be achieved
1	0	NA	0	As per Schedule -II

6. **Non-Hazardous Wastes:**

Sr No	Type of Waste	Quantity	UoM	Treatment	Disposal
NA					

Solid waste from transit mixture washing, muck (debris/sludge) generated from RMC shall either be reused through recovery unit/ Reclaiming system OR disposed off at a designated approved site by local body, for debris / construction waste.

7. **Conditions under Hazardous & Other Wastes (M & T M) Rules 2016 for Collection, Segregation, Storage, Transportation, Treatment and Disposal of hazardous waste:**

Sr No	Category No./ Type	Quantity	UoM	Treatment	Disposal
NA					

8. The consent is issued subject to direction issued by CPCB under section 18(1) (b) of Water (Prevention and Control of Pollution) Act, 1974, regarding classification of Industries dated 07th March 2016.
9. Operation of RMC plant shall be in daytime only. The Day time is reckoned in between 6 a.m. and 6 p.m. i.e. from sun rise to sunset.
10. The Board reserves the right to review, amend, suspend, revoke etc. this consent and the same shall be binding on the industry.
11. This consent should not be construed as exemption from obtaining necessary NOC/permission from any other Government authorities.
12. Project Proponent shall provide adequate Air pollution control arrangements at the source. They shall comply with the provisions under the Air (Prevention and Control of Pollution) Act, 1981 and conditions prescribed.
13. Industry shall provide covering at all the emission generating points.
14. Industry shall carry out monitoring of ambient air quality twice in a week for 24 hours at windward & lean ward direction and submit the data to Board office on monthly basis.
15. The industry strictly follows the Guidelines for Ready Mix Concrete Plant (RMC) for sitting criteria of RMC Plant in the State of Maharashtra as per notification dated 27/11/2024 hosted on MPCB website.
16. The industry shall obtain permission /NOC of CGWA for ground water Extraction and shall not carry any ground water extraction without permission of CGWA.
17. Tree plantation along the periphery inside boundary of the RMC premises having minimum height of 5 mtrs on all sides. The foliage of the trees shall adequacy cover area up to about 20 m height.
18. Barricading all around the periphery of the plot boundary of height minimum 20 feet or 5 feet above free fall air emission area whichever is higher with tin sheets, same may be extended above with neton clothing, whenever required.
19. Storage silos of cement and fly ash shall be equipped with adequate capacity of dust collection system such as multi-cyclone followed by bag house.

20. Handling of cement sand fly ash and aggregates shall be carried out with mechanical closed system only.
21. Storage area of sand & aggregates shall be equipped with roof top water sprinkler system.
22. The captive plant shall be fully covered from all sides like a box structure by using tin/similar type of material within a period of 03 months from the date of issuance of this Notification & shall submit BG of Rs. 1.0 Lakh towards compliance of the same.
23. Global Positioning System (GPS) tracking system shall be installed to all RMC carrying vehicles.
24. Automatic two level tyre washing facility shall be provided ate entry and exit points, for transit mixture vehicles. PP shall ensure that, dust should not spread outside the factory premises through vehicle movement and from the other sources, if any. All vehicles shall be thoroughly cleaned before leaving RMC Plant premises.
25. The Water recycling system shall be provided for sedimentation tank/settling tank. PP shall clean the tank periodically and accumulated sludge/sediments shall be disposed of scientifically. PP shall ensure that, there should not be any overflow of effluent from the tank.
26. The applicant shall make an application for renewal of consent 120 days prior to date of expiry of the consent. (Operate/Renewal)
27. This consent is issued as per the Office Order for Consent Management of the Board No. 12/2020 dtd. 23.12.2020.

This consent is issued on the basis of information/documents submitted by the Applicant/Project Proponent, if it has been observed that the information submitted by the Applicant/Project Proponent is false, misleading or fraudulent, the Board reserves its right to revoke the consent & further legal action will be initiated against the Applicant/Project Proponent.

Received Consent fee of -

Sr.No	Amount(Rs.)	Transaction/DR.No.	Date	Transaction Type
1	45000.00	TXN2505004543	30/05/2025	Online Payment
2	12500.00	TXN2506005463	26/06/2025	Online Payment
3	67500.00	TXN2506005462	26/06/2025	Online Payment

Copy to:

1. Sub-Regional Officer, MPCB, Raigad II
- They are directed to ensure the compliance of the consent conditions.
2. Chief Accounts Officer, MPCB,Sion, Mumbai

SCHEDULE-I

Terms & conditions for compliance of Water Pollution Control:

1. A] As per your application, you have provided Effluent Treatment Plant (ETP) of designed capacity of 2.00 CMD consisting of Primary (Collection tank, Equalization tank), Sludge treatment (Sludge drying bed) for the treatment of 1.0 CMD of trade effluent.

   B] The Applicant shall operate the effluent treatment plant (ETP) to treat the trade effluent and recycle the entire treated effluent into the process for various purposes such as for cooling, process & Scrubbing with metering system so as to achieve Zero Liquid Discharge. There shall be no discharge on land or outside factory premises.

   C] The 100% treated effluent shall be recycled for secondary purposes to achieve the Zzero Liquid Discharge. In no case, effluent shall find its way for gardening / outside factory premises.

2. A] As per your application, you have provided Septic Tank followed by Soak pit for the treatment of 1.0 CMD of sewage.

   B] The Applicant shall operate the sewage treatment system to treat the sewage so as to achieve the following standards.

Sr.No	Parameters	Standards (mg/l)	
1	Suspended Solids	Not to exceed	50
2	BOD 3 days 27°C	Not to exceed	30
3	COD	Not to exceed	100

   C] The treated sewage shall be recycled for secondary purposes to the maximum extent and remaining shall be discharged on land for gardening within premise after confirming above standards. In no case, sewage shall find its way for gardening / outside factory premises.

3. The Board reserves its rights to review plans, specifications or other data relating to plant setup for the treatment of waterworks for the purification there of & the system for the disposal of sewage or trade effluent or in connection with the grant of any consent conditions. The Applicant shall obtain prior consent of the Board to take steps to establish the unit or establish any treatment and disposal system or an extension or addition thereto.
4. The industry shall ensure replacement of pollution control system or its parts after expiry of its expected life as defined by manufacturer so as to ensure the compliance of standards and safety of the operation thereof.
5. The Applicant shall comply with the provisions of the Water (Prevention & Control of Pollution) Act, 1974 and as amended, by installing water meters and other provisions as contained in the said act:

Sr. No.	Purpose for water consumed	Water consumption quantity (CMD)
1.	Industrial Cooling, spraying in mine pits or boiler feed	5.00
2.	Domestic purpose	1.50

Sr. No.	Purpose for water consumed	Water consumption quantity (CMD)
3.	Processing whereby water gets polluted & pollutants are easily biodegradable	0.00
4.	Processing whereby water gets polluted & pollutants are not easily biodegradable and are toxic	0.00
5.	Gardening	0.0

6. The Applicant shall provide Specific Water Pollution control system as per the conditions of EP Act, 1986 and rule made there under from time to time/ Environmental Clearance/ CREP guidelines.

SCHEDULE-II

Terms & conditions for compliance of Air Pollution Control:

1. As per your application, you have provided the Air pollution control (APC) system and erected following stack (s) to observe the following fuel pattern:

Stack No.	Source	APC System provided/proposed	Stack Height(in mtr)	Type of Fuel	Sulphur Content(in %)	Pollutant	Standard
0	NA		0.00	-	-	0	-

2. The Applicant shall provide Specific Air Pollution control equipments as per the conditions of EP Act, 1986 and rule made there under from time to time/ Environmental Clearance / CREP guidelines.
3. The Applicant shall obtain necessary prior permission for providing additional control equipment with necessary specifications and operation thereof or alteration or replacement/alteration well before its life come to an end or erection of new pollution control equipment.
4. The Board reserves its rights to vary all or any of the condition in the consent, if due to any technological improvement or otherwise such variation (including the change of any control equipment, other in whole or in part is necessary).
5. The applicant shall install a comprehensive control system consisting of control equipments as is warranted with reference to generation of emission and operate and maintain the same continuously so as to achieve the level of pollutants to the following standards:
6. Control Equipment:
   - **a. In-house measures :-**
   1. All material transfer points should be covered.
   2. The dust containment system shall be provided incorporating either of the following:

      i) Barricading all around the periphery of the plot boundary of height minimum 20 feet or 5 feet above free fall air emission area. Whichever is height with tin sheets same may extend above with netlon clothing whenever required.

      ii) Water sprinkling/Chemical dust stabilizing agent spraying system along the periphery inside the premises of RMC.

      iii) Tree plantation along the periphery inside boundary of the RMC premises having minimum width of 5 meters, on all sides. The foliage of the trees shall adequately cover area upto about 20m height.
   3. Internal work area shall be, cement concreted/Asphalted

4. Daily cleaning / Removal of dust accumulation inside the plant (dry/wet) shall be carry out with industrial vacuum cleaner.
5. Two level type washing facility shall be provided at entry and exit points, for transit mixture vehicle.

b. Raw material storage & handling:-

1. Storage silos of cement & fly-ash shall be adequate capacity of dust Collection system such as multi – cyclone followed by bag house assembly.
2. Handling of Cement, sand, fly ash and aggregates shall be carried out with mechanical closed system only.
3. Manual operations shall be permitted only in a closed shed, equipped with dust control system at the loading point as well as roof top secondary dust control system.
4. All Conveyor belts of Sand, aggregate shall be covered with tin sheets and at points dust collection system to be installed to avoid secondary fugitive emissions.
5. Mixing section of cement, aggregate & sand shall be equipped with adequate capacity dust collection system, such as multi-cyclone followed by bag houses, so as to limit dust emissions.
6. Storage area of sand & aggregates shall be equipped with roof top water sprinkler system.
7. The production plant shall be interlocked with air pollution control system.
8. Alternative power supply system should cover both the production and Air Pollution control system.
9. Industry shall provide treatment facility industrial effluent.
10. Industry shall provide disposal facility for treated effluent.
11. Industry shall provide disposal facility for solid waste.
12. Industry shall provide proper exhaust system in the premises.

c. Ambient air quality as a distance of 10 mtr form source or the plant boundary whichever is nearer, shall meet the following standards

Particulate Matter PM 10	Not to Exceed	100 ug/m3
Particulate Matter PM 2.5	Not to Exceed	60 ug/m3

d. Solid waste treatment and disposal:

Solid waste from transit mixture washing, muck (debris/sludge) generated from RMC shall either be reused through recovery unit/ Reclaiming system OR disposed off at a designated approved site by local body, for debris / construction waste. Industry shall comply with following additional conditions:

1. The RMC plants where the norms are not followed and the technology is old (Star type) shall be discarded within 1 year. Existing RMC plant shall implement the suggested guidelines within a year. The renewal of Maharashtra Pollution Control Board's consent shall be considered only after implementation of new guidelines. The RMC's having valid consent of Maharashtra Pollution Control Board shall amend their consent in compliance with guideline within a year.
2. Operation of RMC plant shall be in day time only. However in notified MIDC area, notified industrial parks, outside corporation area timing are not applicable. The Day time shall mean from 6 a.m. to 10 p.m.
3. The industry strictly follows the Guidelines for Ready Mix Concrete Plant (RMC) for sitting criteria of RMC Plant in the State of Maharashtra as per notification dated 7/11/2016.

SCHEDULE-III

Details of Bank Guarantees:

Sr. No.	Consent (C2E/ C2O /C2R)	Amt of BG Imposed	Submission Period	Purpose of BG	Compliance Period	Validity Date
1	Consent to Operate	Rs. 1.0/- Lakh	Within 15 days	Towards compliance of consent conditions and O&M of PCS	31.05.2029	30.09.2029

The above Bank Guarantee(s) shall be submitted by the applicant in favour of Regional Officer at the respective Regional Office within 15 days from the date of issue of Consent.

If the above Bank Guarantee is not submitted within stipulated period, then 12% interest will be levied as a penalty as per circular dtd 29/02/2024 No. BO/MPCB/AS(T)/Circular/B-240229FTS0122

BG Forfeiture History

Srno.	Consent (C2E/C2O/C2R)	Amount of BG imposed	Submission Period	Purpose of BG	Amount of BG Forfeiture	Reason of BG Forfeiture
NA						

BG Return details

Srno.	Consent (C2E/C2O/C2R)	BG imposed	Purpose of BG	Amount of BG Returned
NA				

SCHEDULE-IV

General Conditions:

1. The Energy source for lighting purpose shall preferably be LED based
2. The PP shall harvest rainwater from roof tops of the buildings and storm water drains to recharge the ground water and utilize the same for different industrial applications within the plant
3. Conditions for D.G. Set
   a) Noise from the D.G. Set should be controlled by providing an acoustic enclosure or by treating the room acoustically.
   b) Industry should provide acoustic enclosure for control of noise. The acoustic enclosure/ acoustic treatment of the room should be designed for minimum 25 dB (A) insertion loss or for meeting the ambient noise standards, whichever is on higher side. A suitable exhaust muffler with insertion loss of 25 dB (A) shall also be provided. The measurement of insertion loss will be done at different points at 0.5 meters from acoustic enclosure/room and then average.
   c) Industry should make efforts to bring down noise level due to DG set, outside industrial premises, within ambient noise requirements by proper sitting and control measures.
   d) Installation of DG Set must be strictly in compliance with recommendations of DG Set manufacturer.
   e) A proper routine and preventive maintenance procedure for DG set should be set and followed in consultation with the DG manufacturer which would help to prevent noise levels of DG set from deteriorating with use.
   f) D.G. Set shall be operated only in case of power failure.

g) The applicant should not cause any nuisance in the surrounding area due to operation of D.G. Set.

h) The applicant shall comply with the notification of MoEFCC, India on Environment (Protection) second Amendment Rules vide GSR 371(E) dated 17.05.2002 and its amendments regarding noise limit for generator sets run with diesel.

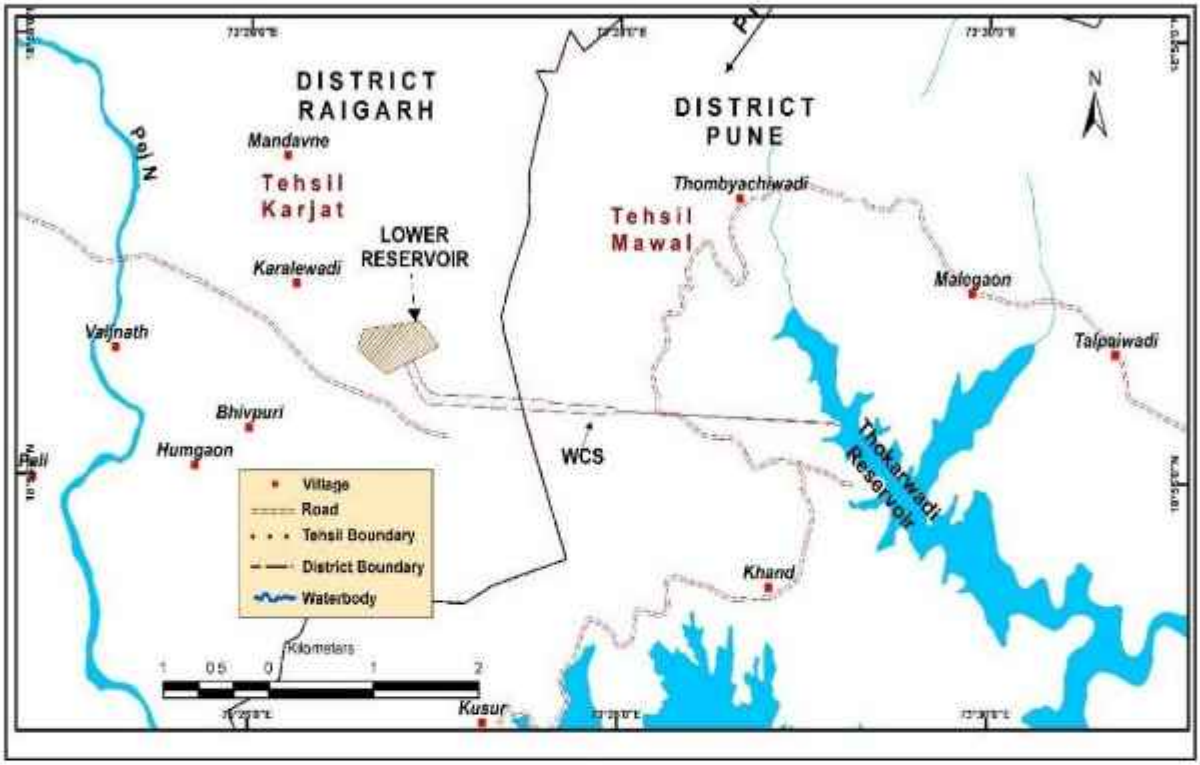
4. The applicant shall maintain good housekeeping.
5. The non-hazardous solid waste arising in the factory premises, sweepings, etc. be disposed of scientifically so as not to cause any nuisance / pollution. The applicant shall take necessary permissions from civic authorities for disposal of solid waste.
6. The applicant shall not change or alter the quantity, quality, the rate of discharge, temperature or the mode of the effluent/emissions or hazardous wastes or control equipments provided for without previous written permission of the Board. The industry will not carry out any activity, for which this consent has not been granted/without prior consent of the Board.
7. The industry shall ensure that fugitive emissions from the activity are controlled so as to maintain clean and safe environment in and around the factory premises.
8. The industry shall submit quarterly statement in respect of industries obligation towards consent and pollution control compliance's duly supported with documentary evidences (format can downloaded from MPCB official site).
9. The industry shall submit official e-mail address and any change will be duly informed to the MPCB.
10. The industry shall achieve the National Ambient Air Quality standards prescribed vide Government of India, Notification No. B-29016/20/90/PCI-L dated. 18.11.2009 as amended.
11. The Board reserves its rights to review plans, specifications or other data relating to plant setup for the treatment of waterworks for the purification thereof & the system for the disposal of sewage or trade effluent or in connection with the grant of any consent conditions. The Applicant shall obtain prior consent of the Board to take steps to establish the unit or establish any treatment and disposal system or an extension or addition thereto.
12. The industry shall ensure replacement of pollution control system or its parts after expiry of its expected life as defined by manufacturer so as to ensure the compliance of standards and safety of the operation thereof.
13. The PP shall provide personal protection equipment as per norms of Factory Act
14. Industry should monitor effluent quality, stack emissions and ambient air quality monthly/quarterly.
15. Whenever due to any accident or other unforeseen act or even, such emissions occur or is apprehended to occur in excess of standards laid down, such information shall be forthwith Reported to Board, concerned Police Station, office of Directorate of Health Services, Department of Explosives, Inspectorate of Factories and Local Body. In case of failure of pollution control equipments, the production process connected to it shall be stopped.
16. The applicant shall provide an alternate electric power source sufficient to operate all pollution control facilities installed to maintain compliance with the terms and conditions of the consent. In the absence, the applicant shall stop, reduce or otherwise, control production to abide by terms and conditions of this consent.
17. The industry shall recycle/reprocess/reuse/recover Hazardous Waste as per the provision contain in the Hazardous and Other Wastes (M & TM) Rules 2016, which can be recycled /processed /reused /recovered and only waste which has to be incinerated shall go to incineration and waste which can be used for land filling and cannot be recycled/reprocessed etc. should go for that purpose, in order to reduce load on incineration and landfill site/environment.
18. An inspection book shall be opened and made available to the Board's officers during their visit to the applicant.

19. Industry shall strictly comply with the Water (P&CP) Act, 1974, Air (P&CP) Act, 1981 and Environmental Protection Act, 1986 and industry specific standard under EP Rules 1986 which are available on MPCB website (www.mpcb.gov.in).
20. Separate drainage system shall be provided for collection of trade and sewage effluents. Terminal manholes shall be provided at the end of the collection system with arrangement for measuring the flow. No effluent shall be admitted in the pipes/sewers downstream of the terminal manholes. No effluent shall find its way other than in designed and provided collection system.
21. Neither storm water nor discharge from other premises shall be allowed to mix with the effluents from the factory.
22. The industry should not cause any nuisance in surrounding area.
23. The industry shall take adequate measures for control of noise levels from its own sources within the premises so as to maintain ambient air quality standard in respect of noise to less than 75 dB (A) during day time and 70 dB (A) during night time. Day time is reckoned in between 6 a.m. and 10 p.m. and night time is reckoned between 10 p.m. and 6 a.m.
24. The industry shall create the Environmental Cell by appointing an Environmental Engineer, Chemist and Agriculture expert for looking after day to day activities related to Environment and irrigation field where treated effluent is used for irrigation.
25. The applicant shall provide ports in the chimney/(s) and facilities such as ladder, platform etc. for monitoring the air emissions and the same shall be open for inspection to/and for use of the Board's Staff. The chimney(s) vents attached to various sources of emission shall be designated by numbers such as S-1, S-2, etc. and these shall be painted/ displayed to facilitate identification.
26. The industry should comply with the Hazardous and Other Wastes (M & TM) Rules, 2016 and submit the Annual Returns as per Rule 6(5) & 20(2) of Hazardous and Other Wastes (M & TM) Rules, 2016 for the preceding year April to March in Form-IV by 30th June of every year.
27. The applicant shall install a separate meter showing the consumption of energy for operation of domestic and industrial effluent treatment plants and air pollution control system. A register showing consumption of chemicals used for treatment shall be maintained.
28. The applicant shall bring minimum 33% of the available open land under green coverage/ plantation. The applicant shall submit a yearly statement by 30th September every year on available open plot area, number of trees surviving as on 31st March of the year and number of trees planted by September end.
29. The Board reserves its rights to review plans, specifications or other data relating to plant setup for the treatment of waterworks for the purification thereof & the system for the disposal of sewage or trade effluent or in connection with the grant of any consent conditions.
30. The firm shall submit to this office, the 30th day of September every year, the Environment Statement Report for the financial year ending 31st March in the prescribed FORM-V as per the provisions of Rule 14 of the Environment (Protection) (second Amendment) Rules, 1992.
31. The Applicant shall obtain necessary prior permission for providing additional control equipment with necessary specifications and operation thereof or alteration or replacement/alteration well before its life come to an end or erection of new pollution control equipment.

32. The Board reserves its rights to vary all or any of the condition in the consent, if due to any technological improvement or otherwise such variation (including the change of any control equipment, other in whole or in part is necessary).
33. The applicant shall provide facility for collection of environmental samples and samples of trade and sewage effluents, air emissions and hazardous waste to the Board staff at the terminal or designated points and shall pay to the Board for the services rendered in this behalf.

This certificate is digitally & electronically signed.

Bhivpuri Off-Stream Open Loop Pumped Storage Project (hereinafter referred to as Bhivpuri PSP) (1000 MW)



Submitted to

R S Envirolink Technologies Pvt. Ltd.

(On behalf of The Tata Power Company Ltd.)

By

Prof. S.K. MISHRA, Principal Investigator
DEPARTMENT OF WATER RESOURCES DEVELOPMENT & MANAGEMENT
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July, 2024

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1.0 PURPOSE OF THE REPORT

The purpose of Watershed Development Plan of **Bhivpuri Off-Stream Open Loop Pumped Storage Project (hereinafter referred to as Bhivpuri PSP) (1000 MW)** is to comply with the Specific Terms of Reference (ToR) for (River Valley/ Irrigation Projects) issued by Ministry of Environment Forests and Climate Change (MoEF&CC), Government of India vide ToR Identification No. TO23A0000MH5102972N, dated: 23.09.2023 for carrying out the EIA/ EMP studies of the project.

The Specific ToR reads **"Scope of watershed development in the 10 km radius of the project shall be studied in consultation with Government Institutions/Indian Council of Agriculture Research (ICAR) and accordingly a detailed Watershed Development Plan shall be prepared and incorporated in EIA/ EMP report"**.

2.0 IDENTIFICATION OF PROJECT AND PROJECT PROPONENT

As one of India's largest integrated power companies, Tata Power has gained a leadership position in the Power sector. Tata Power Company Limited (TPCL), one of India's largest integrated power companies, has a diverse portfolio of power sources with a total installed capacity of 14294 MW. The various sources include hydel, thermal, waste heat recovery, solar, and wind energy. Thermal power stations contribute the most significant share of power generation capacity for TATA Power, accounting for 8860 MW, followed by solar (3142 MW), wind (969 MW), hydro (880 MW), and waste heat recovery or BFG (443 MW). Tata Power is at the forefront of the transition towards green energy. It aligns with the country's ambition of being net zero by 2070. With the recent thrust on development of large-scale renewable (Solar & Wind) projects in the country, TPCL is considering development of pumped-storage hydroelectric projects (PSP) to make use of available surplus wind / solar power during morning and evening/night peak load hours.

Tata Power plans to explore the possibility of building pumped storage plants at the Bhivpuri hydroelectric stations, taking advantage of the increased demand for peak power generation and surplus power availability during off-peak hours. The proposed Bhivpuri PSP would utilize the existing Thokarwadi reservoir as an upper reservoir and construct a new lower reservoir to harness approximately 556 m of gross head.

Bhivpuri Off-Stream Open Loop Pumped Storage Project (1000 MW) (Bhivpuri Pumped Storage Project) located in Pune and Raigad districts of Maharashtra State. It is situated about 20 km from Karjat town. The project site is well connected and accessible throughout the year. Both Upper and Lower reservoirs are accessible from Mumbai and Pune and situated about 80 km from Mumbai and 115 km from Pune in Maharashtra State. The nearest international airport is in Mumbai. Location map of the project is shown in **Figure 1**.

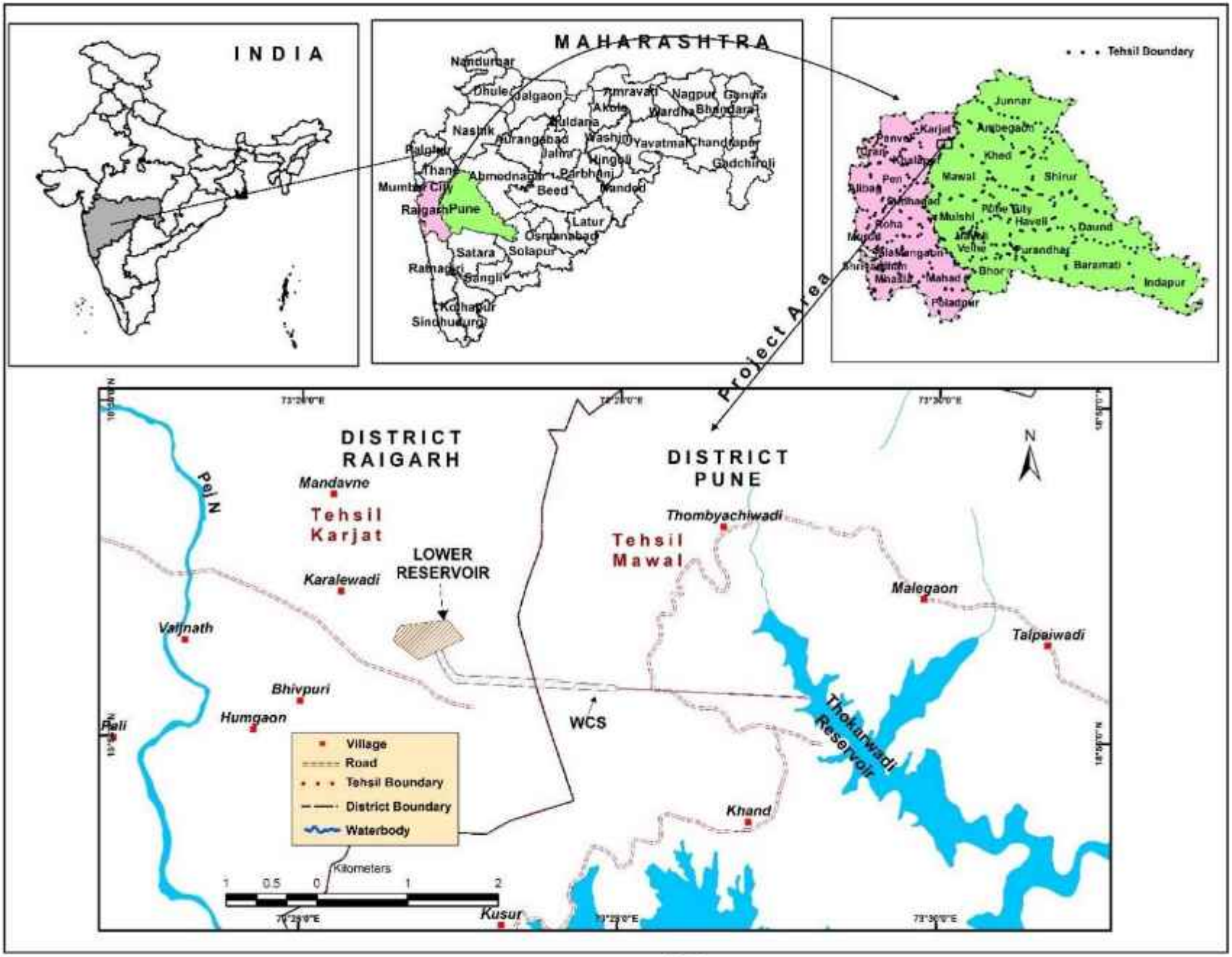


Figure 1: Location Map of Bhivpuri PSP

3.0 PROJECT DESCRIPTION

Bhivpuri PSP is located in Pune and Raigad districts of Maharashtra. It envisages the construction of temporary cofferdam, upper Intake system, water conducting systems, surge shaft, pit powerhouse, lower Intake system, and lower reservoir (equipped with bottom outlet). The scheme will involve the usage of the existing reservoir as an upper reservoir with 12.485 TMC gross storage capacity and will involve construction of 1899.0 m long Geomembrane faced rockfill embankment dam for creation of lower reservoir with 0.163 TMC gross capacity. The complete scheme envisages utilization of design discharge of 216.7 cumec for generation of 1000 MW (4X200+2X100). A rated net head of 520.40 m with design discharge of 173.20 cumec shall be used for generation of 800 MW (4 units of 200 MW each) and a rated head of 516.60 m with design discharge of 43.60 cumec shall be used for generation of 200 MW (2 units of 100 MW each).

The proposed Bhivpuri PSP (4 x 200 MW + 2 x 100 MW) envisages following major civil structures:

- **Upper Reservoir (Existing):** The Upper reservoir, also known as Thokarwadi reservoir, is an existing reservoir situated in a natural depression area. It has the capacity to create a significant pondage behind the Thokarwadi dam, effectively utilizing the depression area and preventing land wastage.

- **Upper Intake:** One intake structure consists of four bays each of 6.20 m width to accommodate 4 numbers of trash rack are placed at the mouth of intake. The size of each intake trash rack is 6.20 m (W) x 12.30 m (H).

- **Head Race Tunnel:** A concrete lined tunnel of length 1981.70 m and diameter of 8.3 m which connects the upper intake to the surge shaft.

- **Pressure Shaft/Buried Penstock (Right Limb):** 1293.50 m long 4.30 m finished diameter steel lined penstock/pressure shaft is proposed. Out of 1293.50 m, in initial reach 236 m is underground & rest of the 1057.50 m is surface penstock buried in concrete. 4.3 m diameter penstock/pressure shaft bifurcates into 2 nos. branch penstock of 3.0 m diameter each & 778.26 m long, leading to powerhouse. Out of 778.26 m length, 572.60 m length is surface penstock buried in concrete & 205.66m length is underground.

- **Pressure Shaft/Buried Penstock (Left Limb):** A steel-lined pressure shaft with a proposed length of 678.40 meters and a finished diameter of 5.30 meters is planned. Out of 678.40 m, 220.88 m long penstock is underground & balanced 457.52 m is surface penstock buried in concrete. This 5.3 m diameter penstock divides into two separate sections. One section is 1427.92 meters long with a diameter of 3.0 meters. Out of 1427.92 m length, 1245.22 m is surface penstock buried in concrete & balanced 182.70 m is underground. The 3.0 m diameter penstock then bifurcates into two-unit penstock. Each penstock has a diameter of 2.15 meters and a length of 52.72 m leading to the powerhouse. The other section of the shaft bifurcates into a 529-meter-long penstock with a diameter of 4.3 meters. This tunnel then divides into two pressure tunnels, each with a diameter of 3.0 meters and a length of 951.64 meters, also leading to the powerhouse.

- **Pit Type Powerhouse & Transformer Bay:** The overall dimensions of the powerhouse are 207.50 m long x 24 m wide x 52 m high. Transformer bay size is 207.55 m x 17.0 m x 23.0 m

- **Tailrace Tunnel:** There are four-unit tail race tunnels with a diameter of 4.50 meters that originate from the power house and connect to the lower diffuser, specifically designed for the larger unit. Additionally, there are two unit tail race tunnels with a diameter of 3.2 meters that also originate from the power house from smaller units and connect to the main TRT of 4.50 m diameter & lower diffuser.

- **Lower Reservoir & Dam (Geo-membrane facing rock fill Dam (GFRD)):** The lower reservoir is situated at the base of the hill in a natural depression that has been identified as suitable for creating an artificial reservoir. The construction of the reservoir involves minor excavation and the establishment of a Geomembrane Filled Rock Filled Dam. To ensure proper containment of water, a geo-membrane is installed on water side of the dam, providing an additional layer of protection. The maximum height of the Geo-membrane facing rock fill Dam (GFRD), is approximately 28.0 meters. This design allows for the creation of the lower reservoir and provides the necessary water storage capacity for the project. The length of the proposed GFRD dam is about 1900 m.

The salient features are given in **Table 1** and Layout map of proposed Bhivpuri PSP are given at **Figure 2**.

Table 1: Salient Features of Bhivpuri PSP

1	**Location**	
	Country	India
	State	Maharashtra
	District	Raigad and Pune
2	**Access to the Project**	
	Road	Accessible from Highway 80 Km from Mumbai
	Nearest Airport	Mumbai Airport
3	**PROJECT**	
	Type	Pumped Storage Project
	Installed Capacity	1000 MW [2 x 100 MW + 4 x 200 MW]
	Peak Generation duration	6 Hours
	Pumping Operation duration	6 Hours 42 Minutes
4	**RESERVOIR LEVELS & STORAGE DETAILS**	
4.1	**Upper Reservoir (Existing)**	
	Latitude	18^0 56' 9.34" N
	Longitude	73^0 29' 14.59" E
	FRL	667.17 m
	MDDL	646.18 m
	Live Storage	353.52 MCM at FRL
4.2	**Lower Reservoir (New proposed)**	
	Latitude	18^0 56' 35.36" N
	Longitude	73^0 26' 39.81" E
	FRL	132.0 m
	MDDL	99.00 m
	Total Storage	4.613 MCM
	Live Storage	4.577 MCM

5	**CIVIL STRUCTURE**	
5.1	**Lower Dam (New Proposed)**	
	Type	GFRD
	Top of Dam	135.0 m
	Maximum Height	28.0 m
	Length	1899.00 m
5.2	**Upper Intake**	
	Type	Diffuser Type
	Number of Intake Structure	1 No.
	Nos of Trash rack bay	4 Nos.
	Size of Trash rack bay	6.20 m (w) x 12.30 m (H)
	Size of Trash rack Panel	20 Nos. [6.70 m (W) x 2.66 m (H) each] 05 Nos. in each bay
	Sill Level of trash rack	629.00 m
	Invert level of Intake Conduit	629.00 m
	Nos. and size of Service Gate	1 Nos.- 6.5 m (W) x 8.3 m (H)
	Nos. and size of Stoplog Gate	1 Nos.- 6.5 m (W) x 8.3 m (H)
	Design Discharge (Each intake)	216.80 Cumec
5.3	**Lower Intake**	
	Type	Diffuser Type
	Number of Intake Structure	5 Nos.
	Nos of Trash rack bay	4 Nos. per Intake (Total 20 nos. Trash rack bays)
	Size of Trash rack bay	4.10 m (w) x 5.0 m (H)
	Size of Trash rack Panel	Size 4.60 m (W) x 2.0 m (H)
	Sill Level of trash rack of Intake	75.0 m
	Invert level of Intake Conduit	74.60 m
	Nos and size of Service Gate	5 Nos.- 3.40 m (W) x 4.50 m (H)
	Nos and size of Stoplog Gate	1 No.- 3.40 m (W) x 4.50 m (H)
	Rated Pumping Discharge (each intake)	43.30 m^3/s
5.4	**Head Race Tunnel [HRT]**	
	Finish Shape and Size	Circular Finish - 8.3 m Diameter, Concrete Lined
	Length	1981.70 m
	Design Discharge	216.80 Cumec
5.5	**Surge Shaft**	
	Finish Shape and Size	Circular Finish – 20.0 m Diameter
	Maximum Up surge	689.50 m
	Minimum Down surge	609.50 m
	Top Elevation of Surge shaft	691.50 m
	Bottom Elevation of Surge shaft	566.42 m
	Diameter of Orifice	4.50 m
5.6	**Surface/Buried Penstock & Pressure Tunnels (Left bifurcation)**	
5.6.1	Surface Penstock	1 No.
	Size and Type	5.30 m Diameter, Circular shape, steel lined
	Design Discharge (each shaft)	144.53 Cumec
	Length	678.40 m
5.6.2	Surface Penstock	1 No.
	Size and Type	4.3 m Diameter, Circular shape, steel lined
	Design Discharge (each shaft)	96.35 Cumec
	Length	529.0 m
5.6.3	Surface Penstock	2 Nos.
	Size and Type	3.0 m Diameter, Circular shape, steel lined
	Design Discharge (each shaft)	48.18 Cumec

	Length	768.94 m
5.6.4	Surface Penstock	1 No.
	Size and Type	3.0 m Diameter, Circular shape, steel lined
	Design Discharge (each shaft)	48.18 Cumec
	Length	1245.22 m
5.6.5	Unit Pressure Shaft	2 Nos.
	Size and Type	3.00m Diameter, Circular shape, steel lined
	Design Discharge	48.18 Cumec
	Length	182.70 m
5.6.6	Pressure Shaft	1 No.
	Size and Type	3.00m Diameter, Circular shape, steel lined
	Design Discharge	48.18 Cumec
	Length	182.70 m
5.6.7	Unit Pressure Shaft	2 Nos.
	Size and Type	2.15m Diameter, Circular shape, steel lined
	Design Discharge	24.09 Cumec
	Length	52.72 m
5.7	**Surface/Buried Penstock & Pressure tunnels (Right bifurcation)**	
5.7.1	Surface Penstock	1 No.
	Size and Type	4.30 m Diameter, Circular shape, steel lined
	Design Discharge (each shaft)	96.36 Cumec
	Length	1293.50 m
5.7.2	Surface Penstock	2 Nos
	Size and Type	3.00 m Diameter, Circular shape, steel lined
	Design Discharge (each shaft)	48.18 Cumec
	Length	605.76 m
5.7.3	Unit Pressure Shaft	2 Nos.
	Size and Type	3.00m Diameter, Circular shape, steel lined
	Design Discharge	48.18 Cumec
	Length	172.50 m
5.8	**POWERHOUSE**	
	Latitude	18^0 56' 19.65" N
	Longitude	73^0 26' 56.73" E
	Type	Pit-type Powerhouse
	Installed capacity	1000 MW [4 x 200 + 2 x 100]
	Number of units	6 Nos.
	Type of turbine	Reversible Francis, Vertical Shaft
	Centre line of generating unit	56.00 m
	Powerhouse size	207.50 m long x 24 m wide x 52
	Design Head (generation)	520.40 m for 200MW unit; 516.60 m for 100MW unit
	Design Head (Pumping)	553.80 m for 200MW unit; 556.30 m for 100MW unit
	Service bay level	70.00 m
5.9	**ACCESS ROAD TO POWERHOUSE**	
	Width	7.0 m
	Length	1200.00 m
	Start Elevation	126.00 m
	End Elevation	70.00 m
5.1	**TRANSFORMER CUM GIS Hall**	
	Type	Surface
	Transformer Bay Size	207.55 m x 17.0 m x 23.0
5.11	**TAIL RACE TUNNEL**	
5.11.1	Unit TRT	2 Nos. (From 100 MW Unit)

	Size and Type	3.20 m Diameter, Circular shape, Steel Lined
	Design Discharge	24.09 Cumec
	Length	77.87 m
5.11.2	Main TRT	5 Nos.
	Size and Type	4.50 m Diameter, Circular shape, Steel Lined
	Design Discharge	48.18 Cumec
	Length	191.41 (Connected with Small Units) 230.21 m (Connected with Big Unit)
5.12	**POTHEAD YARD**	
	Type	Surface
	Size	135.0 m (L) x 51.0 (W)
6	**CONSTRUCTION PERIOD**	
	Construction Period	4 Years excluding 17 months of pre-construction activities
7	**ELECTRO-MECHANICAL EQUIPMENT**	
7.1	**Generating Mode**	
	Turbine Type	Reversible Francis, Vertical Shaft
	Max Net Head	549.37 m for 200MW unit; 545.57 m for 100MW unit
	Min Net Head	495.38 m for 200MW unit; 491.58 m for 100MW unit
	Rated Net Head	520.37 m for 200MW unit; 516.57 m for 100MW unit
	Design Head	531.37 m for 200MW unit; 527.57 m for 100MW unit
7.2	**Pumping Mode**	
	Max Net Head	582.87 m for 200MW unit; 585.27 m for 100MW unit
	Min Net Head	528.88 m for 200MW unit; 531.28 m for 100MW unit
	Rated Net Head	553.87 m for 200MW unit; 556.27 m for 100MW unit
	Design Head	564.87 m for 200MW unit; 567.27 m for 100MW unit
	Design Discharge per unit	For 6 Units
	Generating Mode	43.23 cumec for 200MW unit; 21.78 cumec for 100MW unit
	Pumping Mode	38.78 cumec for 200MW unit; 19.30 m for 100MW unit
7.3	**Generator Motor**	
	Generator Type	Vertical shaft, Synchronous generator, Suspended type
	Turbine Efficiency (Generation)	0.92
	Turbine Efficiency (Pumping)	0.93
	Generator Efficiency	98.50%
	Synchronous Speed	375 rpm for 200MW Unit; 500 rpm for 100 MW unit
	Generator Voltage	18 kV for 200MW Unit; 18 kV for 100 MW Unit
	Transmission Voltage	400 kV
	Generator Step up Transformer	87 MVA, 1 Phase, 18kV/400 kV for 200MW unit (total 13 Nos.)
		44 MVA, 1 Phase, 18kV/400 kV for 100MW unit (total 7 Nos.)
8	**ANNUAL ENERGY**	
	Annual Energy for Generation	2079.42 MU
	Generation Duration (Peaking)	6 Hours
	Annual Energy for Pumping	2578.97 MU
	Pumping Duration	6 Hours 42 Minutes

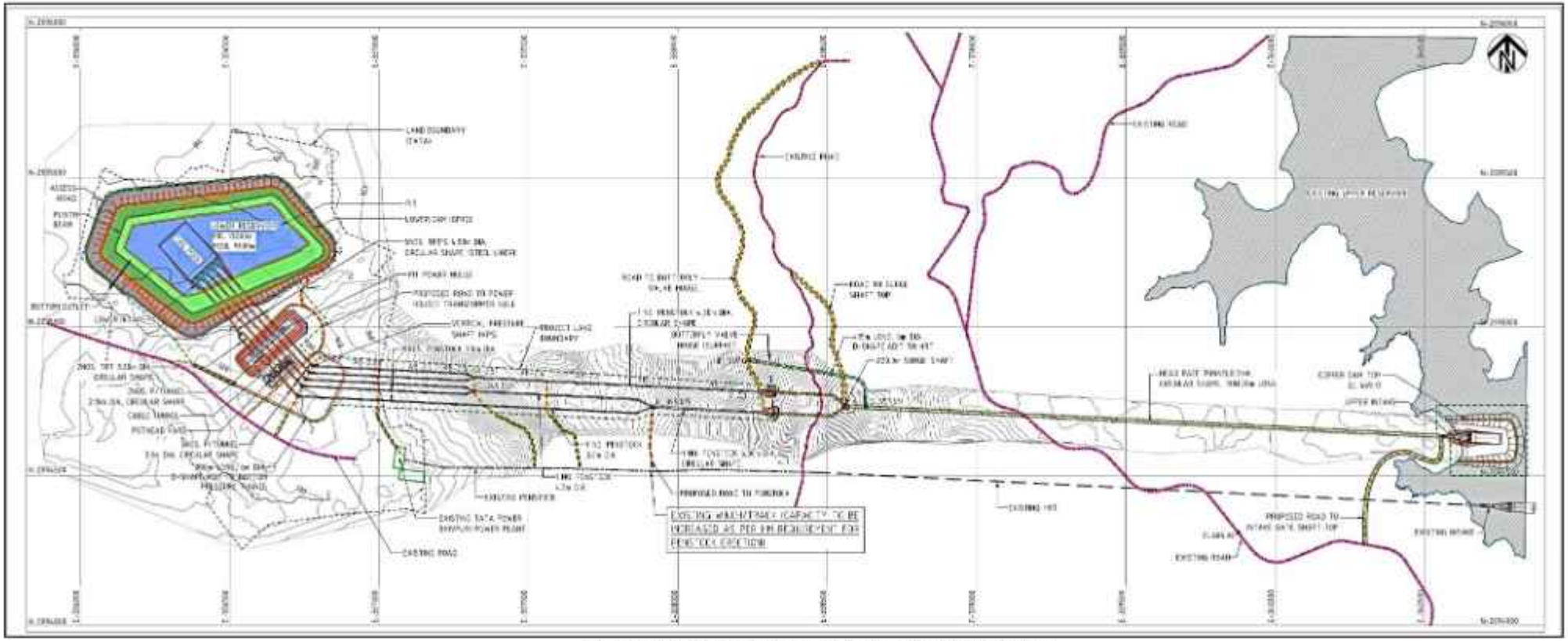


Figure 2: Project Layout Map of Bhivpuri PSP

4.0 NEED FOR WATERSHED DEVELOPMENT PLAN

Watershed development and management can be defined as the process of formulating and carrying out course of action involving manipulation of natural, agricultural, and human resources of a watershed to provide resources that are desired by and suitable to the watershed community by making sure that these actions don't have any adverse effects of soil and water resources. It works on an integrated and multi-disciplinary approach. Primary principles include protecting fertile top layer soil, minimizing setting up of tanks, in situ conservation of rainwater, construction of check dams for increasing ground water recharge and arresting soil erosion, water harvesting for supplemental irrigation, utilizing the land based on its capability etc.

Approach under the present study focusses on soil and water conservation measures along with raising crop productivity and livelihood improvement in watersheds. Major objectives of the watershed management program are:

- Conservation, up-gradation, and utilization of natural endowments such as land, water, plant, animal, and human resources in a harmonious and integrated manner with low-cost, simple, effective, and replicable methods.
- Generation of massive employment so as to reduce dependence on resources around and arrest exploitation of same
- Reduction of inequalities between irrigated and rain-fed areas and poverty alleviation.
- Reduction of organic, inorganic and soil pollution load
- Provision for adequate supply of water for domestic, industrial and agricultural needs
- Flood control through small man-made reservoirs and other water impounding structures
- To avoid or minimize the adverse impacts of the project on surrounding environment and society

Preparation of watershed development plan involves identification of watershed problems and formulation of development and management plan. The following physical components have been included in the present watershed development plan:

- Land/Soil and water conservation measures
- Plantation/horticulture activities
- Agronomical practices
- Livestock management
- Renewables
- Alternative employment avenues to reduce impact on resources
- Capacity building/Institutional mechanism

In addressing above aspects for watershed development, community participation has to be mobilized to create sustainable outcome like awareness, implementation in consultation with the community and help of various user groups.

5.0 METHODOLOGY

The various steps, covered in the study, are as follows:

- Defining study area
- Delineating sub-watershed around study area
- Consideration of components of sub-watershed management

- Assessment of Vulnerability in sub-watershed
- Socioeconomic surveys
- Suggestion of treatment measures for watershed management
- Cost estimation

6.0 STUDY AREA

Study area has been defined as for the purpose of preparation of watershed development plan. As per Terms of reference, watershed development plan has to be prepared for Watersheds falling within 10 km radius of the project. More precisely, study area considered for the preparation of Watershed Development Plan is the area of all the Watersheds covering the area being considered for the Environmental Impact Assessment study and as per Terms of Reference accorded by the MoEF&CC, Govt. of India for the project. As stipulated in the Terms of Reference, the area being considered for the Environmental Impact Assessment study is the area within 10 km radius of the main project components like proposed reservoirs, pump house, water conductor system etc. The total geographical area of the study area delineated for the Watershed Development Plan is **590.15 sq km (**refer **Figure 3)**.

7.0 DELINEATING SUB-WATERSHEDS AROUND STUDY AREA

In order to plan watershed management and to formulate action plans it requires Sub-watershed delineation, therefore, study area was further delineated into Sub-watersheds. For the delineation of Sub-watershed, Watershed Atlas of India prepared by Soil and Land Use Survey of India (SLUSI) has been referred.

As per Watershed Atlas of India, the study area falls in 9 Sub-watersheds. The nomenclature of Sub-watersheds has been assigned as follows: All drainage flowing into Bay of Bengal except those at 2 & 3 and All drainage flowing into Arabian Sea except that at 1 Region (4 and 5 respectively); Krishna and North Western Ghats Basin (4D and 5B respectively); Upper Bhima and Savatri to Tapi Catchment (4D7 and 5B2 respectively); Bhima and Ulhas Sub-Catchment (4D7F & 5B2B respectively); Andra Indrayani Kundli, Bhima Bhama and Ulhas Watershed (4D7F8, 4D7F9 and 5B2B7 respectively) and 9 Sub-watersheds. The detail of Sub-watersheds delineated is given below in **Figure 3 and Table 2**.

Table 2: Names and Codes of Sub-watersheds Delineated

S. No.	Water Resource Region	Basin	Catchment	Sub-Catchment	Watershed	Sub-watershed	Sub-watershed Area (ha)
1	All drainage flowing into Bay of Bengal except those at 2 & 3 (4)	Krishna (4D)	Upper Bhima (4D7)	Bhima (4D7F)	Andra Indrayani Kundli (4D7F8)	4D7F8s	5262.78
2						4D7F8u	12461.65
3					Bhima Bhama (4D7F9)	4D7F9h	5213.71
4	All drainage flowing into Arabian Sea except that at 1 (5)	North Western Ghats (5B)	Savatri to Tapi (5B2)	Ulhas (5B2B)	Ulhas (5B2B7)	5B2B7g	6308.84
5						5B2B7h	8901.46
6						5B2B7j	5905.27
7						5B2B7k	4857.09
8						5B2B7n	6485.37
9						5B2B7p	3618.68
TOTAL							**59014.84**

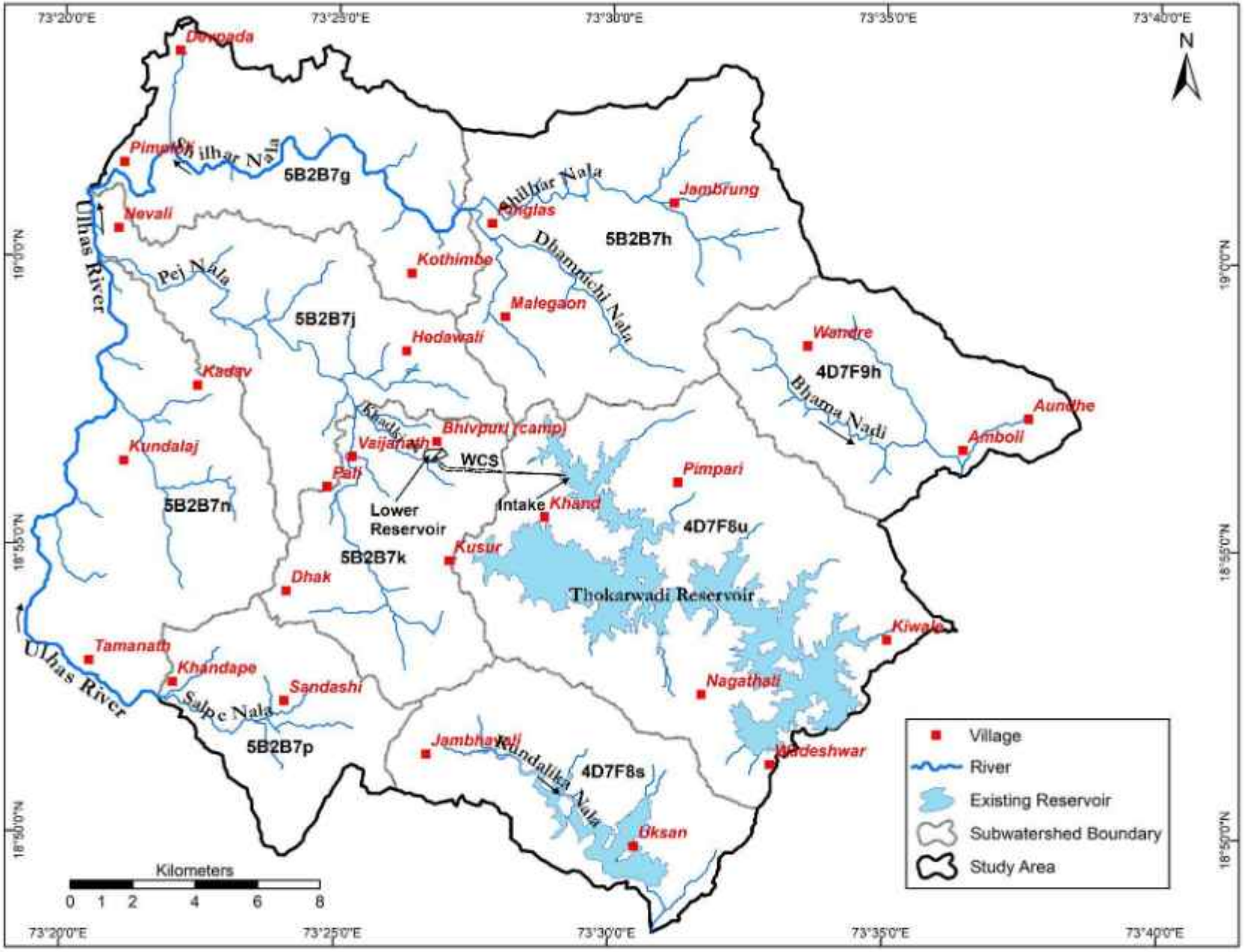


Figure 3: Map showing Study Area and Sub-Watersheds Delineated

8.0 COMPONENT OF SUB-WATERSHED MANAGEMENT CONSIDERED IN THE PRESENT STUDY

Approach needs to be based upon the integration of technologies within the natural boundaries of a drainage area for optimum development of land, water, and plant resources to meet the basic needs of people and animals in a sustainable manner. Basically, aim is to improve the standard of living of common people by increasing his earning capacity by offering all facilities required for optimum production.

In order to achieve its objective, integrated watershed management suggests to adopt land and water conservation practices, water harvesting in ponds and recharging of groundwater for increasing water resources potential and stress on crop diversification, use of improved variety of seeds, integrated nutrient management and integrated pest management practices, etc.

8.1 Land and Soil Management Practices

Land and Soil management practices are the primary step of watershed management program. The land characteristics such as terrain, slope, formation, depth, texture, moisture, in-filtration rate and soil capability are the main to consider under land management activities for watershed development. In broad sense the land management interventions includes following activities:

- Vegetative measures
- Structural measures
- Production measures; and
- Protection measures.

8.2 Water Management Practices

Under watershed management task the water management is one of the very important components. A good water potential in watershed provides a conducive path for its overall development. In watershed the main source of water is the rainfall; however, the incoming ground water from surrounding areas also shares to some extent.

In order to manage the rainwater, it is very essential to check the out flowing rain water. It could be done by constructing the structures like pond, reservoirs etc. in the area. Also, the rain dependent farming systems can be practiced for better utilization of rainwater is also considered as a measure for water management. Apart from conserving the rainwater, their judicious use either for crop production or other farm operations, also play very significant role in water management.

As for as the water management regarding irrigation point of view is concerned, the selection of most suitable irrigation method depending on the crop, soil, land topography, availability of water in the area etc., is very important. Those irrigation methods should always be at priority, which have better water use efficiency, lesser loss of water etc. Similarly, the choice on cropping system, crop variety, and crop duration etc., based on the water availability can also be very effective in water management.

Overall, various interventions followed for water management are outlined below:

- Rainwater harvesting.

- Ground water recharge.
- Maintenance of water balance.
- Preventing water pollution.
- Economic use of water.

Conservation practices can be divided into two main categories:

- In-situ and
- Ex-situ management.

Land and water conservation practices, those made within agricultural field like construction of contour bunds, graded bunds field bunds, terraces building broad bed and furrow practice and other soil-moisture conservation practices, are known as in-situ management. These practices protect land degradation, improve soil health, and increase soil-moisture availability and groundwater recharge.

Moreover, construction of check dam, farm pond, gully control structures, pits excavation across the stream channel is known as ex-situ management. Ex-situ watershed management practices reduce peak discharge in order to reclaim gully formation and harvest substantial amount of run-off, which increases groundwater recharge and irrigation potential in watersheds.

8.3 Biomass Management through Improved Agronomic Practices

In a watershed the task of biomass management can be achieved by following intervention areas:

- Eco-preservation
- Biomass regeneration
- Forest management and conservation
- Plant protection and development of social forestry
- Increasing productivity of animals
- Income and employment generation activities
- Coordination of health and sanitation programmes
- Better standard of living of people
- Eco-friendly lifestyle of people, and
- Formation of learning community.
- Integrated Pest and Nutrient Management
- Crop Diversification and Intensification

Watershed management puts emphasis on crop diversification and intensification through the use of advanced technologies, especially good variety of seeds, balanced fertilizer application and by providing supplemental irrigation.

8.4 Integration of On and Off Farm Practices

Farmers those solely dependent on agriculture, hold high uncertainty and risk of failure due to various extreme events, pest and disease attack, and market shocks. Therefore, integration of agriculture (on-farm) and non-agriculture (off-farm) activities is required at various scales for generating consistent source of income and support for their livelihood. For example,

agriculture, livestock production and dairy farming, together can make more resilient and sustainable system compared to adopting agriculture practice alone. Product or by-product of one system could be utilized for other and vice-versa e.g. biomass production (crop straw) after crop harvesting could be utilized for livestock feeding and manure obtained from livestock could be applied in field to maintain soil fertility. It includes horticulture plantation, aquaculture, and animal husbandry at indivisible farm, household or community scale.

8.5 Capacity Building/ Institutional Mechanism

Watershed development requires multiple interventions that jointly enhance the resource base and livelihoods of the rural people and it requires their capacity building. Capacity building is a process to strengthen the abilities of people to make effective and efficient use of resources in order to achieve their own goals on a sustained basis. Unawareness and ignorance of the stakeholders about the objectives, approaches, and activities are the reasons that affect the performance of the watersheds.

Capacity building program focuses on construction of low-cost soil and water conservation methods, production and use of bio-fertilizers and bio-pesticides, income generating activities, livestock-based activities, waste land development, market linkage for primary stakeholders etc. The stakeholders should be aware about the importance of various activities, their benefits in terms of economics, social and environmental factors.

Therefore, organizing various training at different scales is important for watershed development. Besides, there are some other components needs to the considered like, livestock management, afforestation, rural energy management, development of community skills and resources etc.

9.0 VULNERABILITY ASSESSMENT OF SUB-WATERSHEDS

The various steps undertaken in assessing vulnerability of Sub-watersheds in the study area, are as follows:

- Defining data requirement
- Data acquisition and preparation
- Output presentation
- Prioritization

The above-mentioned steps are briefly described in the following paragraphs:

9.1 Defining Data Requirement

Soil loss has been calculated through RUSLE (Revised Universal Soil Loss Equation) model which is computed by the following equation:

Soil Loss (A) = R*K*LS*C*P

Wherein;

A = Soil loss (Tons/ha/year)

R is Rainfall & Runoff Erosivity Factor (MJ mm ha^{-1} h^{-1} yr^{-1}), which depends upon the annual average rainfall in mm. Data required for R factor is rainfall intensity.

K is Soil Erodibility Factor (t ha h MJ^{-1} mm^{-1}), which depends on the organic matter, texture permeability and profile structure of the soil. Also, it is a constant value for each soil type. Data required for K factor is soil type.

LS is Topographic Factor (dimensionless) which depends upon flow accumulation and steepness and length of slope in the area. Data required for LS factor is slope length and slope gradient.

C = Vegetation Cover and Crop Management Factor (dimensionless), which is the ratio of bare soil to vegetation and non- photosynthetic material. It is a constant value for each land use category. Data required for C factor is land use/ land cover.

P is Conservation Supporting Practice Factor (dimensionless), which takes into account specific erosion control practices like contour bunding, bench terracing etc.

9.2 Data Acquisition and Preparation

The data on various aspects was collected from different sources. Soil map of the catchment area was prepared from soil map of Maharashtra procured from Regional Centre of National Bureau of Soil Survey & Land Use Planning (NBSS&LUP), New Delhi. For the preparation of DEM and preparation of Slope map, Shuttle Radar Topography Mission (SRTM) 3 Arc-Second Global Digital Terrain Elevation Data (DTED) data has been used. For the preparation of land use/ land cover, map prepared by National Remote Sensing Centre (NRSC), Indian Space Research Organisation (ISRO) of Dept. of Space, Govt. of India with Partner Institution, Maharashtra Remote Sensing Application Centre, Govt. of Maharashtra has been used. The rainfall data in the catchment area has been sourced from Climatic Research Unit (CRU), a component of the University of East Anglia and one of the leading institutions concerned with the study of natural and anthropogenic climate change.

a. Rainfall Erosivity (R) Factor

R factor is a function of the falling raindrop and rainfall intensity and is estimated as the product of the kinetic energy (E) of the raindrop and the maximum intensity of rainfall (I30) over duration of 30 min in a storm. The erosivity of rain is calculated for each storm, and these values are summed up for each year. In this study, the storm wise rainfall data were not available for the computation of rainfall erosivity factor (R); therefore, the relationship between seasonal value of R and average rainfall has been used. The rainfall erosivity factor has been defined as $R = 81.5 + 0.38X$, where, R is the average seasonal erosivity factor (MJ mm ha^{-1} h^{-1} $year^{-1}$), and X is the annual average rainfall (mm).

For the estimation of rainfall erosivity in the study area, average rainfall of 10 years has been taken from the High-resolution gridded CRU datasets. In the absence of site specific periodic data, CRU data from the year 2011 to 2020 has been used for the calculation of R factor. In and around the study average rainfall of 10 years have been taken from the rain gauge station for the estimation of rainfall erosivity. The rainfall erosivity factor (R) has been calculated using equation $R = 81.5 + 0.38X$ for annual average rainfall of observed and simulated data. The values from R have been adopted in this study to calculate soil erosion using RUSLE (**Figure 4**).

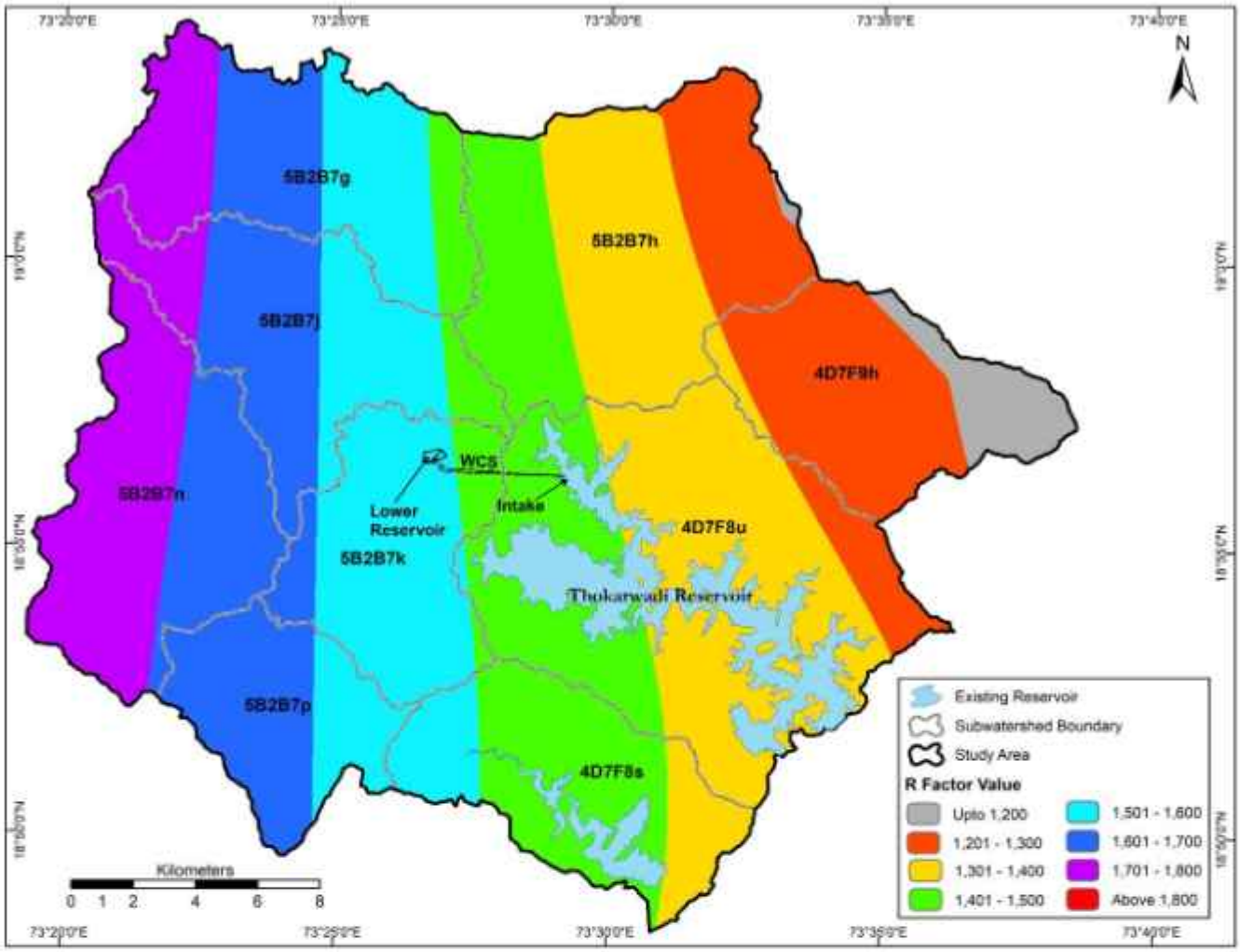


Figure 4: R Factor Map of Study Area

b. Soil Erodibility (K) Factor

The K factor is an expression of the inherent erodibility of the soil or surface material at a particular site under standard experimental conditions. It is a function of the particle-size distribution, organic-matter content, structure, and permeability of the soil or surface material. Prior to deciding the K values, soil map for the area is prerequisite. Soil map procured from NBSS&LUP, Nagpur was digitized. The dominant soil mapping unit is S77 (60.0%), characterised by very shallow, excessively drained, loamy soils on moderately steeply sloping highly dissected hill ranges with escarpments and narrow valleys with very severe erosion, followed by soil mapping unit S33 (26.71%), characterised by shallow, well drained, loamy soils on moderately steeply sloping dissected hills and intervening valley with severe erosion. **Annexure-I** show an example shallow soil of the area under study. Rest all soil mapping units covers less than 10% of the study area. Soil map has been shown in **Figure 5**. The legend for soil unit classes is given in **Table 3**.

As per the soil map of the study area, the soil can be classified in three major categories. Moderately deep to very shallow with moderate erosion have moderate K value i.e. 0.15. Shallow to extremely shallow with severe erosion has slightly high K value i.e. 0.25. Very shallow with very severe erosion has high K value i.e. 0.325. Various classes of soil and the values of K are given in **Table 4** and shown in **Figure 6**.

Table 3: Description of Soil Units in the Study Area

Mapping Unit	Description	Taxonomic Classification	Area (ha)	Area (%)
S021	Extremely shallow, somewhat excessively drained, loamy soils on moderately steeply sloping undulating and rolling lands with severe erosion; *associated with*: Slightly deep moderately well drained, loamy soils on very gently sloping lands with moderate erosion.	• **Loamy-skeletal, mixed, isohyper-thermic, Lithic Ustorthents** • **Fine-loamy, mixed, isohyper-thermic, Typic Ustropepts**	5386.50	9.13
S028	Moderately deep, well drained, loamy soils on gently sloping elongated ridges/ hills with moderate erosion; *associated with*: Shallow, well drained, loamy soils with moderate erosion.	• **Fine-loamy, mixed, isohyper-thermic, Typic Ustropepts** • **Loamy, mixed, isohyper-thermic, Lithic Ustropepts**	33.26	0.06
S033	Shallow, well drained, loamy soils on moderately steeply sloping dissected hills and intervening valley with severe erosion; *associated with*: Very shallow, well drained, loamy soils on gently sloping lands with moderate erosion.	• **Loamy, mixed, isohyper-thermic, Typic Ustropepts** • **Loamy, mixed, isohyper-thermic, Lithic Ustropepts**	15764.08	26.71
S077	Very shallow, excessively drained, loamy soils on moderately steeply sloping highly dissected hill ranges with escarpments and narrow valleys with very severe erosion	• **Loamy, mixed, isohyper-thermic, Lithic Ustorthents**	35408.42	60.00
S083	Shallow, well drained, clayey soils on moderately sloping highly dissected hill ranges on north Sahyadri with moderate erosion; *associated with*: Slightly deep, moderately well drained, clayey soils with moderate erosion.	• **Clayey, mixed, isohyper-thermic, Typic Ustropepts** • **Clayey, montmorillonitic, isohyper-thermic, shallow, Typic Ustropepts**	21.85	0.04
S118	Very shallow, well drained to somewhat excessively drained, loamy soils on gently sloping undulating lands with moderate erosion; *associated with*: Very shallow, well drained to somewhat excessively drained, loamy soils with moderate erosion and moderate stoniness.	• **Loamy, mixed, isohyper-thermic, Lithic Ustorthents** • **Loamy-skeletal, mixed, isohyper-thermic, Lithic Ustorthents**	2400.72	4.07
	Total		**59014.84**	**100**

Table 4: Soil Erodibility Factor for different Soil Types

S. No.	Soil Type	Erosion Intensity	K Value
1	Very shallow	Very severe	0.325
2	Shallow to extremely shallow	Severe	0.25
3	Moderately deep to very shallow	Moderate	0.15

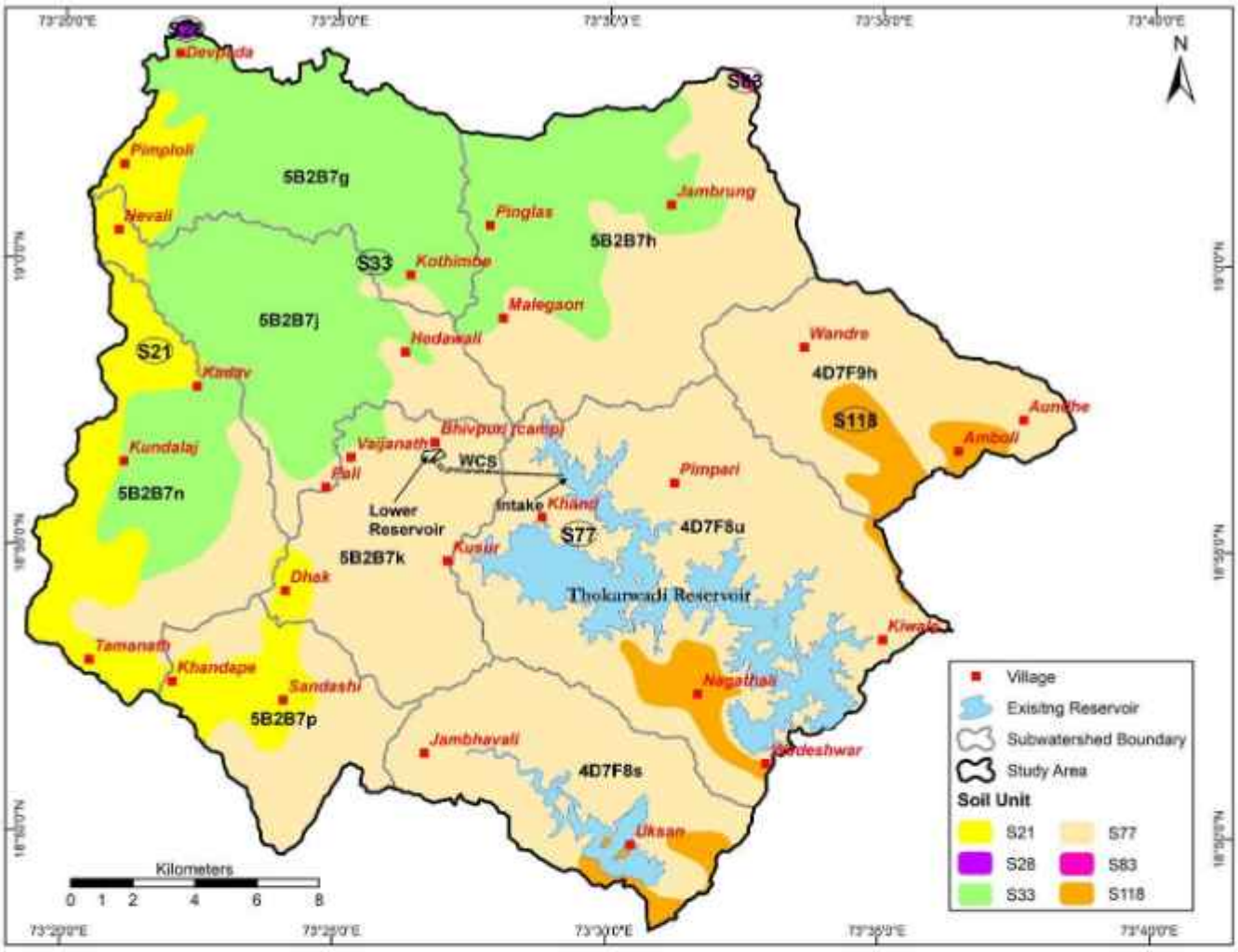


Figure 5: Soil Map of Study Area (For details of Soil Unit legend refer Table 3)

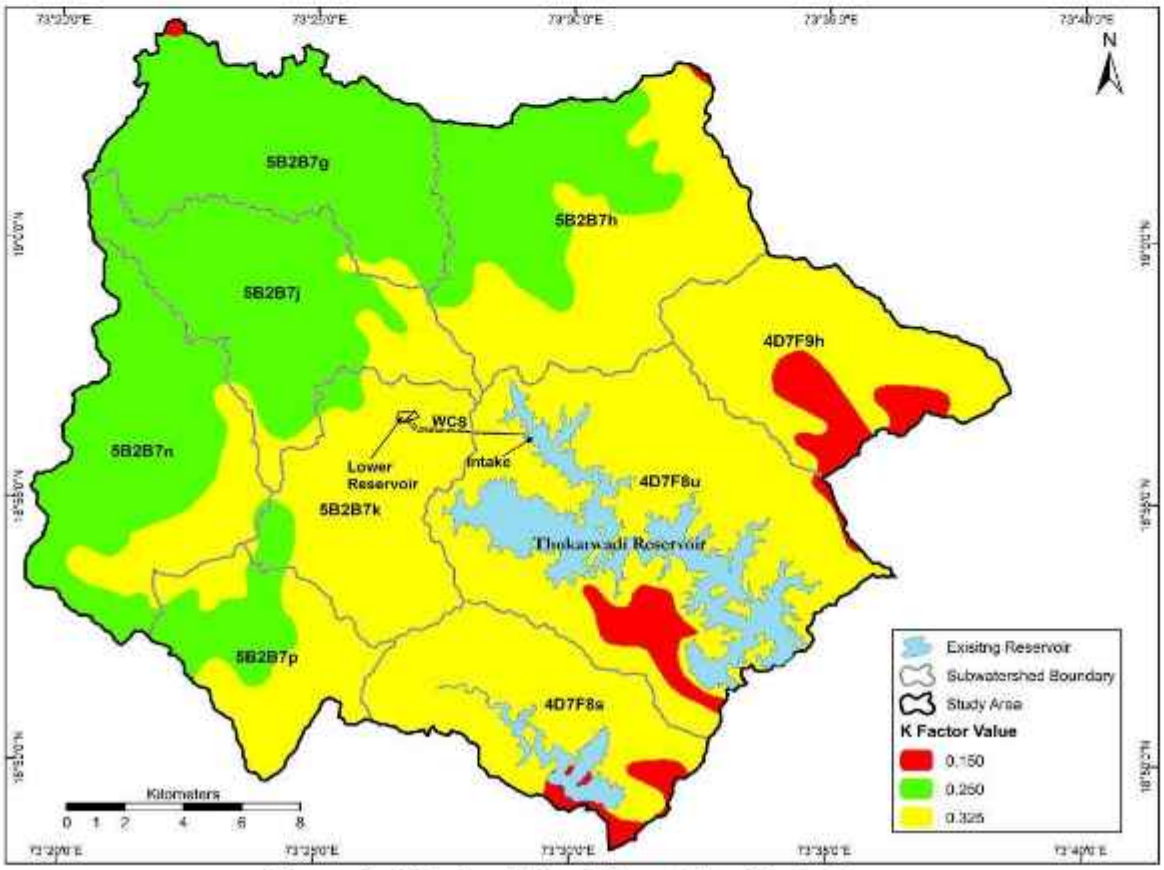


Figure 6: K Factor Value Map of the Study Area

c. Topographic (LS) Factor

The LS factor is an expression of the effect of topography, specifically hill slope length and steepness, on rates of soil loss at a particular site. The value of 'LS' increases as hill slope length and steepness increase, under the assumption that runoff accumulates and accelerates in the down-slope direction. Digital Elevation Model (DEM) and Slope of a particular area is prerequisite for LS factor. As already discussed, SRTM data has been used for DEM and the same DEM has been used for the preparation of slope map. The slope map in degrees prepared for the study area is given at **Figure 7**. In the study area, the slope ranges from 0° to around 75°. The LS factor prepared for the study area is given at **Figure 8**.

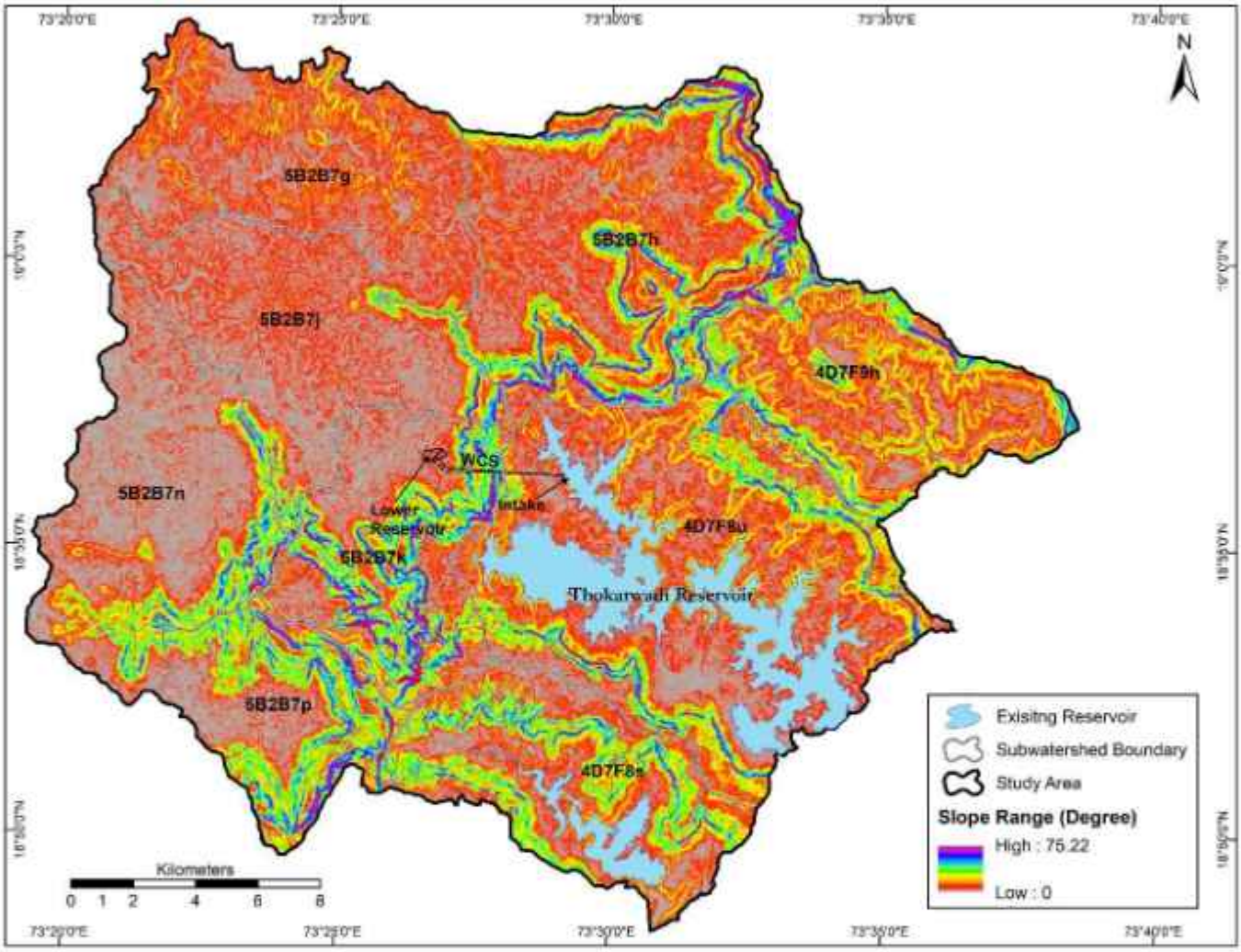


Figure 7: Slope Map of Study Area

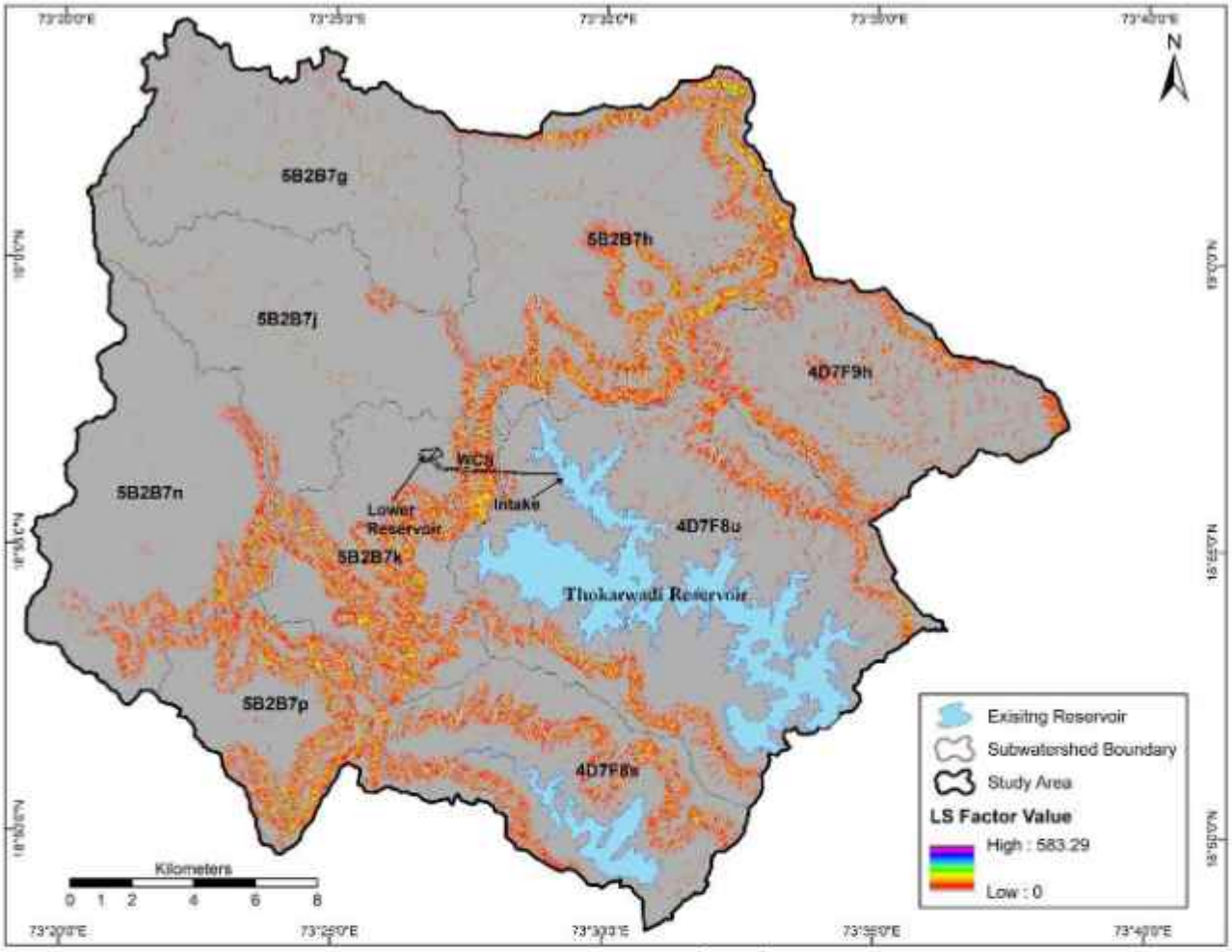


Figure 8: LS Factor Map of Study Area

b. Crop Management (C) Factor

The C factor is an expression of the effect of surface cover and roughness, soil biomass, and soil-disturbing activities on rates of soil loss at a particular site. The value of C decreases as surface cover and soil biomass increase, thus protecting the soil from rain splash and runoff. In the present study, the land use/land cover map prepared by National Remote Sensing Centre (NRSC), Indian Space Research Organisation (ISRO) of Dept. of Space with Partner Institution, Maharashtra Remote Sensing Application Centre, Govt. of Maharashtra has been used.

The classified land use/ land cover map of the study area is shown as **Figure 9**. The land use/ land cover pattern of the study area has been given in **Table 5**. As can be seen from the map and table, the land use/ land cover pattern can be classified into nine classes, out of these, agricultural land covers the maximum area i.e. 28.08%, followed by evergreen/ semi evergreen forest, covering 20.54%. Scrub land covers 19.34% of the area. Deciduous forest and scrub forest covers 7.77% and 7.05% of the area respectively. Fallow land covers 9.36% of the area. Waterbody covers 6.89% of the area. Rest all the other classes covers 0.96% of the area.

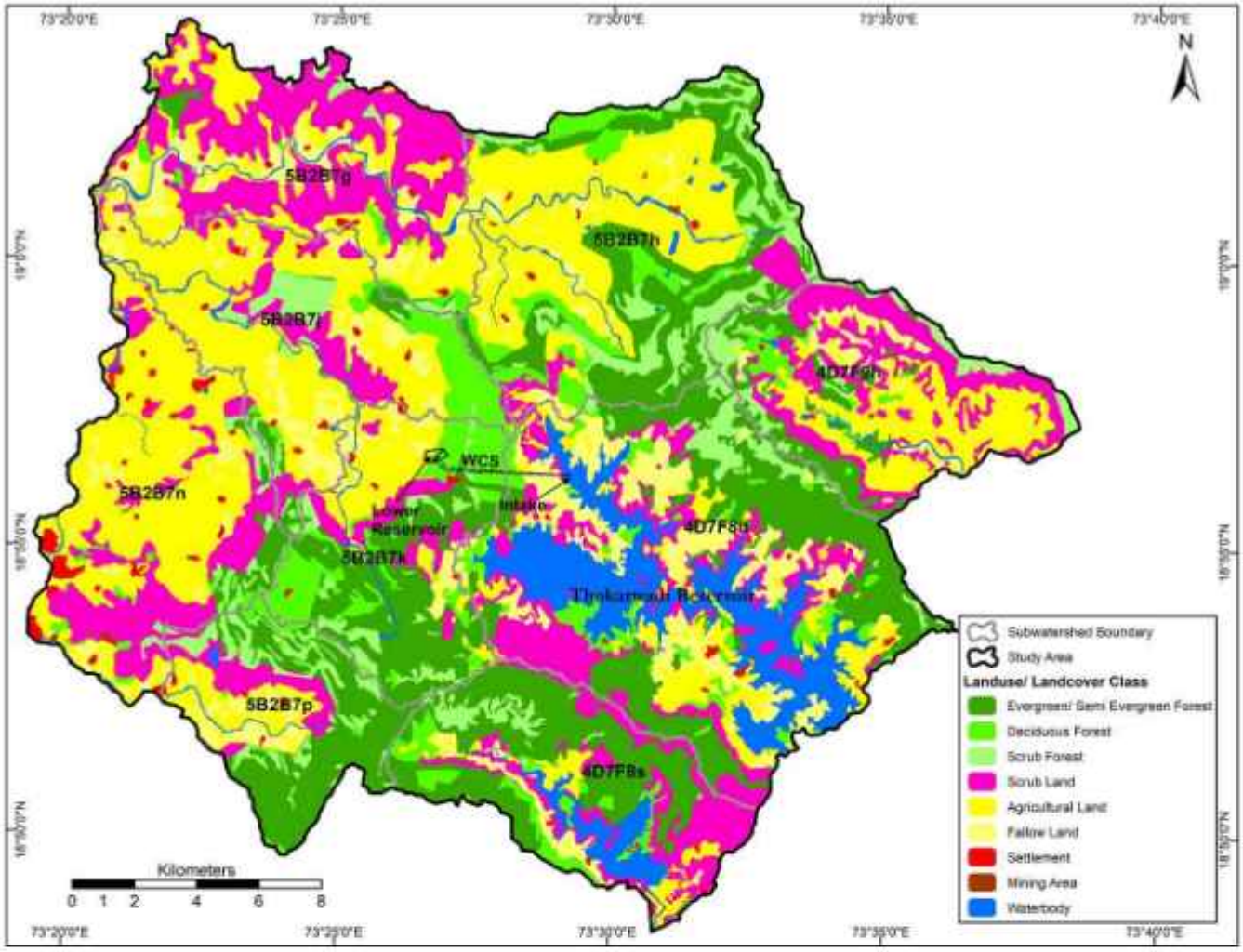


Figure 9: Land use/ Land cover Map of Study Area

Table 5: Area Falling Under Different Land Use/ Land Cover Classes

Land use/ Land cover Classes	Area (ha)	Area (%)
Evergreen/ Semi Evergreen Forest	12122.31	20.54
Deciduous Forest	4585.43	7.77
Scrub Forest	4161.73	7.05
Scrub Land	11414.14	19.34
Agricultural Land	16573.19	28.08
Fallow Land	5523.97	9.36
Settlement	557.59	0.94
Mining Area	11.49	0.02
Waterbody	4065.00	6.89
Total	**59014.84**	**100**

Table 6 describes the cover management factors used in the model under different land use/land cover categories. **Figure 10** shows the map of C Factor.

Table 6: Crop Management Factor

S. No.	Land use/ Land cover Type	C Value
1	Fallow Land	0.03
2	Scrub Forest and Scrub Land	0.02
3	Evergreen/ Semi Evergreen Forest, Deciduous Forest	0.01
4	Agricultural Crop Land	0.005
5	Settlement, Mining Area & Waterbody	0.00

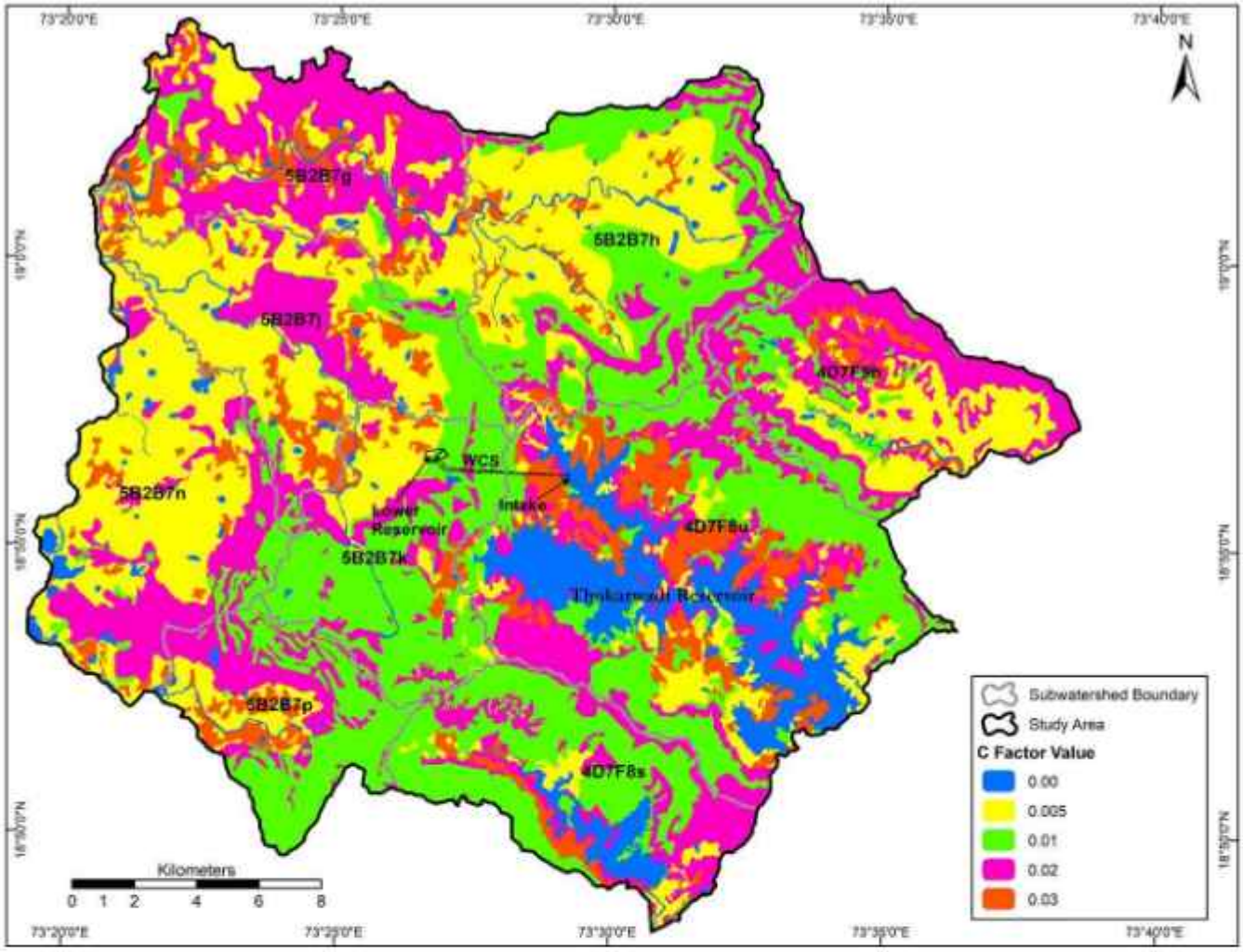


Figure 10: C Factor Map of Study Area

e. Conservation Support Practice (P) Factor

The P factor is an expression of the effects of supporting conservation practices, such as contouring, buffer strips of vegetation, and terracing, on soil loss at a particular site. It is the ratio of soil loss with specific support practice to the corresponding loss with up-or down-slope cultivation. In the present study, the P factor has been considered as 1.

9.3 Output Presentation

A thematic map for soil loss of the study area has been prepared using RUSLE model mentioned in the above section. The study area was then demarcated into different soil erosion intensity mapping units or classes based upon the extent of soil loss (see **Table 7 & Figure 11**). The study area under different Erosion Intensity categories is given in **Table 7**. As can be seen from the figure and table, around 44% of the study area is prone to less than 1 tons/ha/annum soil erosion, i.e. under negligible erosion intensity category. Around 21% of its area is prone to Severe and Very Severe soil erosion.

Table 7: Area falling under different Erosion Intensity Categories

S. No.	Soil loss in tons/hectare/annum	Erosion Intensity Category	Area (ha)	Area (%)
1	<1	Negligible	26123.95	44.27
2	1-5	Slight	6649.64	11.27
3	5-10	Very Low	3878.46	6.57

S. No.	Soil loss in tons/hectare/annum	Erosion Intensity Category	Area (ha)	Area (%)
4	10-20	Low	4576.53	7.75
5	20-40	Moderate	5433.23	9.21
6	40-80	Severe	5445.59	9.23
7	>80	Very Severe	6907.43	11.70
Total			**59014.84**	**100**

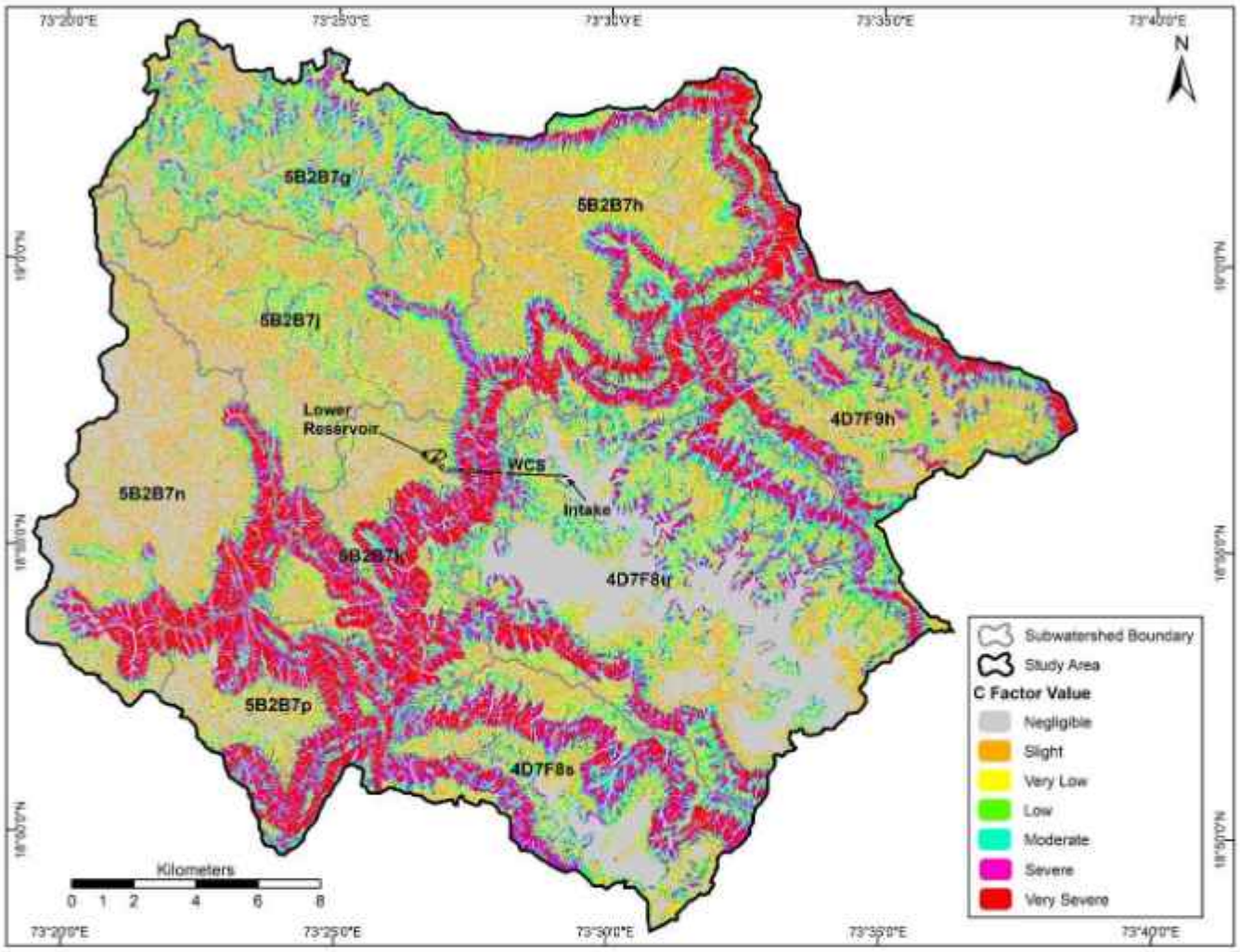


Figure 11: Erosion Intensity Map of Study Area

9.4 Prioritization of Sub-Watersheds using Silt Yield Index (SYI) Method

`Silt Yield Index' (SYI), method has been used for prioritization of Sub-watersheds for treatment. The Silt Yield Index (SYI) is defined as the Yield per unit area and SYI value for hydrologic unit is obtained by taking the weighted arithmetic mean over the entire area of the hydrologic unit by using suitable empirical equation. The Silt Yield Index Model (SYI) considers sedimentation as product of erosivity, morphometry and delivery ratio of a particular Sub-watershed and was conceptualized by Soil and Land Use Survey of India (SLUSI) as early as 1969 and has been operational since then to meet the requirements of prioritization of smaller hydrologic units within river valley project areas. Silt yield index (SYI) was calculated using following empirical formula:

$$SYI = \frac{\Sigma (Ai * Wi) * Di * 100}{Aw}; \quad \text{where } i = 1 \text{ to } n$$

where,

Ai	=	Area of ith unit (EIMU)
Wi	=	Weightage value of ith mapping unit
n	=	No. of mapping units
Aw	=	Total area of Sub-watershed.
Di	=	Delivery ratio

9.4.1 Erosion Intensity Mapping Unit

Erosion Intensity Mapping Units (EIMU) are demarcated and defined as per the soil erosion intensity map prepared above. Various EIMU categories, such as Very Severe, Severe, Moderate, Low, Very Low, and Negligible & Slight (clubbed together), were then used to calculate Sub-watershed wise SYI. Erosion Intensity Mapping Units (EIMU) is a composite expression of physiography, land use, and conservation practices adopted. While computing soil erosion intensity, all the factors (physiography, land use, and conservation practices) are already taken into consideration. Therefore, EIMUs are assumed as per the soil erosion intensity in the Sub-watershed.

9.4.2 Weightage Value

Each erosion intensity unit is assigned a weightage value. When considered collectively, the weightage value represents approximately the comparative erosion intensity. A basic factor of K = 10 was used in determining the weightage values. The value of 10 indicates a static condition of equilibrium between erosion and deposition. Any addition to the factor K (10+X) is suggestive of erosion in ascending order whereas subtraction, i.e. (10-X) is indicative of deposition possibilities. The weightage value assigned to erosion mapping unit in a Sub-watershed ranges from 11-20.

9.4.3 Delivery Ratio

Delivery ratios were adjusted for each of the erosion intensity unit. The delivery ratio suggests the percentage of eroded material that finally finds entry into reservoir or river/ stream. Delivery ratios are assigned to all erosion intensity units depending upon their distance from the nearest stream. The criteria adopted for assigning the delivery ratio are as follows:

Nearest Stream	Delivery ratio
0 - 0.9 km	1.00
1.0 - 2.0 km	0.95
2.1 - 5.0 km	0.90
5.1 - 15.0 km	0.80
15.1 - 30.0 km	0.70

9.4.4 Silt Yield Index

The area of each of the mapping units is computed and silt yield indices of individual Sub-Sub-watersheds are calculated using the equations mentioned above. The SYI values for classification of various categories of erosion intensity rates are given in **Table 8**.

Table 8: Calculation of SYI in Sub-watersheds

Sub-watershed	EIMU	EIMU Area (EA) (ha)	Weightage Factor (WF)	Silt Yield (SY) = EA * (WF)	Delivery Ratio (DR)	SYI = (SY*DR*100)/SA
4D7F8s	1	719.20	20	14383.99	0.85	1308
	2	776.16	20	15523.17		
	3	602.20	18	10839.62		
	4	409.21	16	6547.29		
	5	312.79	14	4379.10		
	6	2443.22	12	29318.66		
Total		**5262.78**		**80991.85**		**1308**
4D7F8u	1	819.00	20	16380.04	0.85	1223
	2	1095.60	20	21912.01		
	3	1388.20	18	24987.55		
	4	1133.82	16	18141.09		
	5	777.36	14	10883.07		
	6	7247.67	12	86972.00		
Total		**12461.65**		**179275.76**		**1223**
4D7F9h	1	641.20	20	12823.93	0.85	1301
	2	664.02	20	13280.39		
	3	684.70	18	12324.53		
	4	483.34	16	7733.45		
	5	384.98	14	5389.70		
	6	2355.48	12	28265.78		
Total		**5213.71**		**79817.80**		**1301**
5B2B7g	1	93.43	20	1868.53	0.9	1258
	2	338.18	20	6763.64		
	3	785.03	18	14130.48		
	4	788.36	16	12613.79		
	5	591.37	14	8279.13		
	6	3712.48	12	44549.76		
Total		**6308.84**		**88205.33**		**1258**
5B2B7h	1	1489.09	20	29781.77	0.85	1288
	2	880.23	20	17604.68		
	3	842.08	18	15157.36		
	4	666.66	16	10666.49		
	5	690.83	14	9671.63		
	6	4332.57	12	51990.88		
Total		**8901.46**		**134872.80**		**1288**
5B2B7j	1	191.60	20	3831.99	0.85	1129
	2	208.41	20	4168.26		
	3	271.53	18	4887.60		
	4	438.50	16	7015.93		
	5	509.30	14	7130.15		
	6	4285.93	12	51431.15		
Total		**5905.27**		**78465.08**		**1129**
5B2B7k	1	1216.43	20	24328.65	0.8	1265
	2	628.24	20	12564.80		
	3	369.67	18	6654.13		
	4	280.40	16	4486.46		
	5	223.82	14	3133.41		
	6	2138.52	12	25662.24		
Total		**4857.09**		**76829.69**		**1265**

Sub-watershed	EIMU	EIMU Area (EA) (ha)	Weightage Factor (WF)	Silt Yield (SY) = EA * (WF)	Delivery Ratio (DR)	SYI = (SY*DR*100)/SA
5B2B7n	1	704.09	20	14081.75	0.9	1228
	2	313.35	20	6267.07		
	3	193.64	18	3485.60		
	4	206.69	16	3307.04		
	5	262.15	14	3670.11		
	6	4805.44	12	57665.34		
Total		**6485.37**		**88476.91**		**1228**
5B2B7p	1	1033.39	20	20667.90	0.85	1380
	2	541.39	20	10827.85		
	3	296.19	18	5331.35		
	4	169.56	16	2712.97		
	5	125.87	14	1762.19		
	6	1452.27	12	17427.25		
Total		**3618.68**		**58729.51**		**1380**

9.4.5 Prioritization of Sub-watersheds

The Sub-watersheds are subsequently rated into various categories corresponding to their respective SYI values. The criteria followed for priority categorization of Sub-watersheds depending upon their SYI values is given below and the priority classification of individual Sub-watershed is given in **Figure 13** and **Table 9**.

Priority categories	SYI Values
Very high	> 1300
High	1200-1299
Medium	1100-1199
Low	1000-1099
Very Low	<1000

Table 9: Priority Number as per SYI Classification

S. No.	Sub-watershed	SYI Value	Priority
1	4D7F8s	1308	Very High
2	4D7F8u	1223	High
3	4D7F9h	1301	Very High
4	5B2B7g	1258	High
5	5B2B7h	1288	High
6	5B2B7j	1129	Medium
7	5B2B7k	1265	High
8	5B2B7n	1228	High
9	5B2B7p	1380	Very High

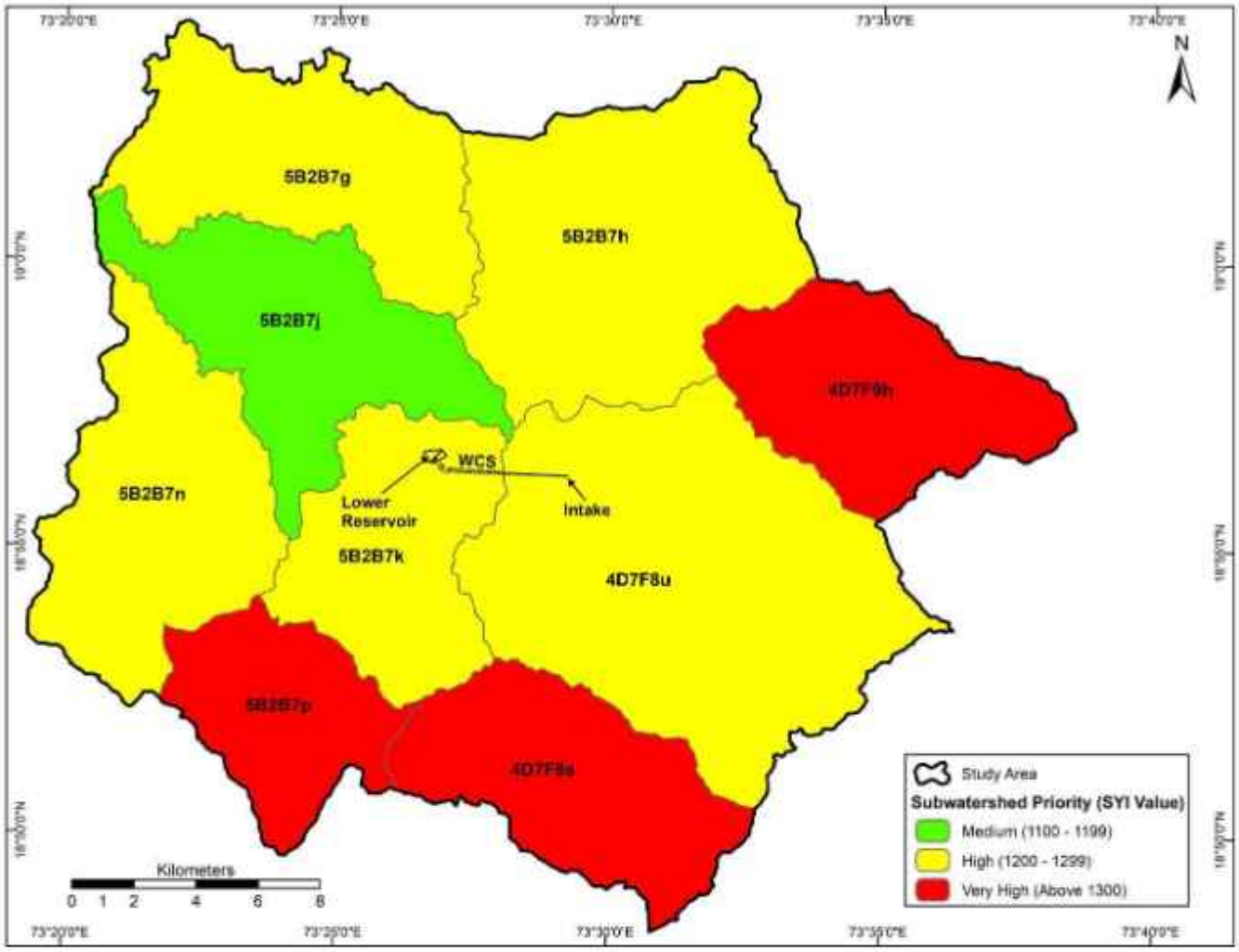


Figure 12: Sub-watersheds Priority Classification Map of Study Area

10.0 SOCIO-ECONOMIC SURVEY

The objective of conducting socio-economic baseline survey in the study area is to understand the overall socio-economic situation of the area and identify potential challenges in agricultural production. This survey aims to suggest areas where technology transfer can promote sustainable development. It will help create a plan to improve socio-economic conditions and preserve natural resources, supporting those who rely on the watershed for their livelihoods. Also, it will act as a benchmark for analysing impact of watershed interventions after implementation of recommended interventions.

For this survey, semi-structured interviews and focus group discussions with key informants and villagers in selected villages within study area were carried out. A total of 11 villages were surveyed, with household interviews conducted randomly among 5% of the total households. The surveyed villages are listed in **Table 10**, location of the surveyed village is shown in **Figure 13**. The study employed semi-structured interviews, field visits, and ground-truthing to understand existing cultivation practices and issues related to crop production within the study area.

The secondary data have been collected through district census books, Mission Antyodaya 2020, pamphlets, websites etc.

Table 10: List of Surveyed Villages

S. No	Tehsil	Village Name
District: Raigad		
1	Karjat	Vaijanath
2	Karjat	Bhivpuri
3	Karjat	Humgaon
4	Karjat	Mandawane
5	Karjat	Gaulwadi

S. No	Tehsil	Village Name
District: Pune		
6	Mawal	Vadeshwar
7	Mawal	Khand
8	Mawal	Malegaon Bk.,
9	Mawal	Malegaon Kh.
10	Mawal	Pimpari
11	Mawal	Sawale

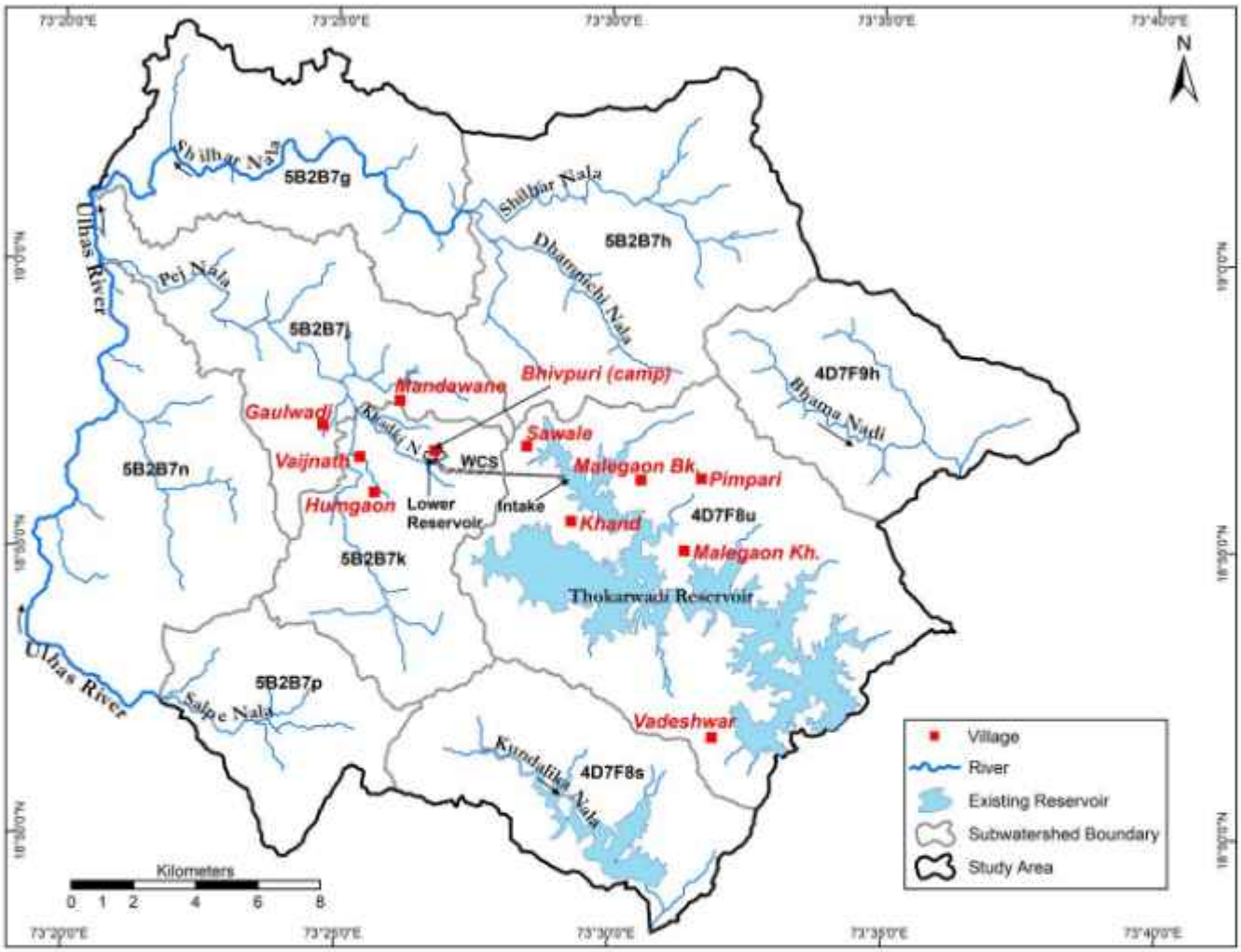


Figure 13: Surveyed Villages in the Study Area

10.1 Demographic Profile of the Study Area

There are total of 121 villages falling in the study area; of these, 89 are in Karjat tehsil of Raigad district, 5 are in Khed tehsil of Pune district and 27 are in Mawal tehsil of Pune district. The summary of the demographic profile of villages in the study area based on the Census of India 2011 is given below.

- **Total Population of the Study Area = 90096**
- Male = 45922
- Female = 44174
- **Total SC Population in the Study Area = 3571**
- Male SC = 1790
- Female SC = 1781

❖ **Total ST Population in Study Area= 28185**

- Male ST = 14098
- Female ST = 14087

10.2 Socio-Economic Profile & Demographic Condition of Surveyed Villages

The study found that the majority of respondents were in the middle age group (30-60 years), followed by the old age group (above 60 years), with some participants in the young age group (20-30 years) also. The average farming experience in the study area was relatively high, averaging 26 years, particularly among middle-aged farmers (35-64 years) who were the main interviewees.

The total population of the surveyed villages is 12,591, with 6,520 (51.78%) males and 6,071 (48.21%) females. The number of households are 2,634, with an average occupancy of 4-5 persons per household. The child population below 6 years old was found to be 1,446, which is 11.48% of the total population. The sex ratio was found to be 931 females per 1000 males.

Out of the total population, 391 are scheduled castes, accounting for 3.10% of the total population of surveyed villages, of which 196 are male and 195 are female. The population of scheduled tribes is 5,389, accounting for 42.80% of the total population, of which 2,721 are male and 2,668 are female. The project area is mainly inhabited by the ***Mahadev Koli*** tribal community, predominantly residing in Mawal tehsil of Pune district.

The literacy rate in the villages is 67.01% (for those above the age of 6), with males and females having rates of 73.78% and 59.75%, respectively, creating a gender gap of 14.3%. During the field survey, it was noted that the literacy level among farmers is moderately low in the surveyed villages.

10.2.1 Occupation

During the field survey it was found that most of the households in the region have income in the following ranges: approximately 45% earn between Rs. 25,000 to Rs. 50,000, approximately 25% earn between Rs. 50,000 to Rs. 100,000, approximately 20% earn between Rs. 100,000 to Rs. 250,000, and approximately 10% earn more than Rs. 250,000 per year.

Agriculture and allied activities are the primary activities in the villages around the project area, with around 43% relying on crop farming, 32% working as agricultural labourers, 10% engaged in other work (such as in factories or cities, business, transport, government, and private jobs), and 5% involved in animal husbandry. Many resorts and hotels are present in the project surrounding area, which provide employment opportunities to the villagers, with around 10% of the people engaged in hotels and resorts.

There is a dam named Thokarwadi Dam, attracting visitors from outside the district as well as nearby areas for travel purposes. **Annexure-I** show some photographs of the reservoir and the boating activity. Local residents and farmers from the villages sell their locally produced goods to tourists, supporting their livelihoods.

Apart from agriculture, villagers also go to the forest to collect firewood, mangoes, berries, and honey. They sell these products in the Karjat Market for their livelihood.

During the field visit, flower farming and poultry farming was observed in the area. The villagers sell flowers to the nearest market and tourists for their livelihood. Most of the women groups in the area are involved in poultry farming. It was observed that more number of poultry farms are available in the villages of Karjat tehsil within the study area.

Regarding livestock management, activities like fodder collection, fodder preparation and feeding of livestock are handled by women. However, preparation of animal feed, transportation of manure, application and grazing of animals are done jointly by men and women. Thus, agricultural and livestock management activities, which fall under the productive sector of gender roles, show that while men have dominant roles, women also play important roles for livelihood purposes.

Within the household, activities related to cooking, fetching water and collecting fodder are performed by women.

10.2.2 Land Holdings

Land Resources, whether private or common are an extremely important asset for rural communities. At the village level it is the land resources which allow for the satisfaction of the needs/demands of fuel wood, and fodder for livestock and other everyday resources.

The data presented in **Table 11** shows that among the surveyed villages, over 3.18 ha is designated as barren and uncultivable land, while the village area boasts 2596.12 ha of forest cover. Approximately 3044.43 ha is under agricultural use within the total surveyed villages land. The Mandawane village have 6.58 ha pastures and other Grazing land. Consultation with several farmers in the surveyed villages revealed that each farmer owns about 4-5 hectares on average.

Table 11: Land Use Pattern in the Surveyed Villages

Village Name	Forest Area (ha.)	Area under Non-Agricultural Uses (ha.)	Barren & Un-cultivable Land Area (ha.)	Permanent Pastures and Other Grazing Land Area (ha.)	Culturable Waste Land Area (ha.)	Fallows Land other than Current Fallows Area (ha.)	Current Fallows Area (ha.)	Net Area Sown (ha.)
Vaijanath	0	45.83	0	0	126.14	14.1	25.17	66.45
Bhivpuri	37.79	109.72	3.18	0	5.3	0	0	0
Humgaon	506.58	57.05	0	0	0	0	90.35	95.32
Mandawane	73.35	70.01	0	6.58	102.15	281.75	0	114.35
Gaulwadi	0.4	15	0	0	212	0	0	146.6
Vadeshwar	299	575	0	0	17	0	0	652
Khand	209	576	0	0	66.54	0	0	435.46
Malegaon Bk.	78	289	0	0	94.75	0	0	310.25
Malegaon Kh.	22	286	0	0	42	0	0	252
Pimpari	1254	78	0	0	0	0	0	535
Sawale	116	360	0	0	388	0	0	437

Village Name	Forest Area (ha.)	Area under Non-Agricultural Uses (ha.)	Barren & Un-cultivable Land Area (ha.)	Permanent Pastures and Other Grazing Land Area (ha.)	Culturable Waste Land Area (ha.)	Fallows Land other than Current Fallows Area (ha.)	Current Fallows Area (ha.)	Net Area Sown (ha.)
Total	2596.12	2461.61	3.18	6.58	1053.88	295.85	115.52	3044.43

Most farmers in the surveyed area are small-scale, with about 35% lacking irrigation and relying on rainfall for farming. Four surveyed villages (Vaijanath, Humgaon, Mandawane, and Gaulwadi) have canal and drip irrigation facilities.

10.2.3 Irrigation and Groundwater Level

The predominant sources of irrigation for landholders across the study area are canals and rivers, with approximately 80% of irrigated farmers relying on these as their primary water sources. Some farmers have wells in their fields for irrigation purposes. Conversely, around 20% of farmers are dependent on rainfall for cultivation.

Based on farmers' responses, the groundwater level in the region ranges between 480 m to 700 m. Considering the bore well adoption rate of the farmers in the study area, it is revealed that only approximately 15% of farmers currently have functional bore wells, indicating that only a few farmers have irrigation facilities. The study found that some farmers in the region have adopted bore wells. Notably, 40% of farmers have reported water scarcity, particularly in villages located within the project's upper reservoir area during the summer season. The absence of adequate irrigation infrastructure in the study area poses a significant challenge to agricultural practices and water management.

10.2.4 Cropping Pattern & Livestock Raring

Primarily the economy of the district depends on agriculture where Sugarcane, Paddy, Pearl Millet, Groundnut, Soyabean and Pigeon Pea are the major crops of kharif season, which are mainly rainfed crops except Sugarcane which is mainly cultivated in irrigated lands. The major rabi season' crops are Sorghum, wheat, Chickpea and Maize. Mango, Sapota and Custard Apple are the major fruit crop, Onion, Potato, Tomato, Brinjal, Okra and Chilli are major vegetables and Rose, Marigold, Tuberose and Chrysanthemum are the major flowers cultivated in the study area.

In the surveyed villages, the predominant crops cultivated includes paddy, groundnut, pulses, and finger millets. The major crop in the area is paddy.

Under irrigated conditions, the major fruit crops (horticultural crops) grown include sapota, mango and cashew, while vegetable horticultural crops such as brinjal, green chilli, and leafy vegetables are also prominent.

Around 40% of the population keep hens, followed by goats and buffalos. Most of the household keep buffalos in the study area. Animal sales and animal products serve as a source of income for the villagers. Livestock is sold for cash to cover expenses and purchase basic household goods.

10.2.5 Agriculture

Paddy is cultivated as a food grain crop on large scale in existing reservoir and proposed reservoir in the project area.

The agricultural season is divided into four seasons. The period from December to February is the dry and comparatively cool season. The summer season starts from March and lasts till May. This is followed by the southwest monsoon from June to September, while October and November constitute the post-monsoon or northeast monsoon season. The rainy season starts from June and lasts till September. The rainfall in the southwest monsoon period is most important for the sowings of dry crops such as groundnut, pulses, and millets, etc. The paddy crop covers more than 70% of the total cropped area **(**refer **Figure 14).**

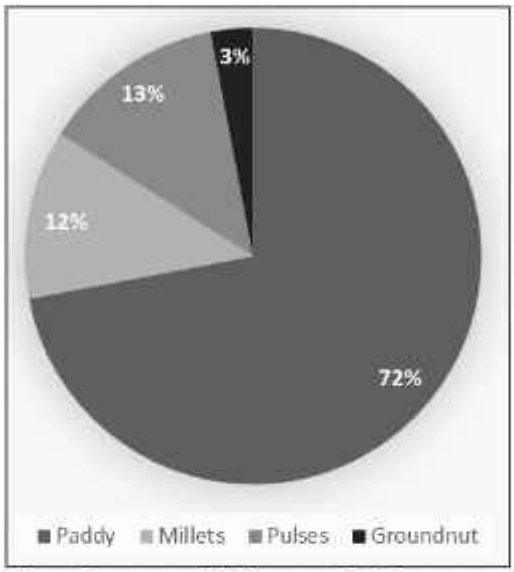


Figure 14: Area distribution of different field crops in the Study Area

The major horticulture fruit crops grown are mango, sapota, and cashew, while the horticulture vegetable crops cultivated include brinjal, onion, okra, potato, green chili, and leafy vegetables. The area distribution of fruit crops is depicted in **Figure 15.**

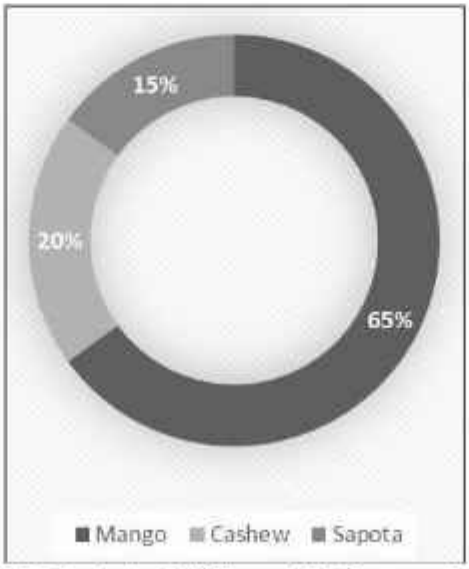


Figure 15: Area distributed of different fruit crops in the Study Area

During field surveys, interactions with farmers revealed that paddy is cultivated as a food grain crop on a large scale in the study project area, as well as in the tehsils of Pune and Raigad district.

According to farmer respondents, many parts of Maharashtra, including the surveyed area, are transitioning from water-intensive paddy cultivation to the innovative Saguna rice technique, which manages soil and water more efficiently while yielding better harvests.

The farmer respondents mentioned using fertilizers such as urea, single superphosphate, and muriate of potash in paddy fields.

State government schemes, like Maharashtra's initiative to conserve soil and water through good agricultural practices, include measures such as harvesting rainwater through the construction of check dams and ponds, adopting crop diversification, seed production, and nursery raising in waterlogged areas, as well as adopting drip and sprinkler irrigation systems to save 30-37% water and enhance crop quality and productivity. During the survey it was found that the farmers in the study area have benefited from the drip irrigation system. Some of the Farmers also expressed concerns about the low availability of water, which has resulted in crop losses in the surveyed area.

10.2.6 Status of household & Farm assets in the Study Area

The baseline survey reveals that nearly all households surveyed have mobile phones, followed by televisions (approx. 95%), bikes (approx. 50%), bicycles (approx. 30%), tractors (approx. 2%), and a smaller percentage owning refrigerators and washing machines.

10.2.7 Migration

About 50% of household members in the study area are engaged in temporary migration for agricultural labour, with the focus mainly on male migration due to educational activities and labour work in nearby cities. In contrast, tribal female migration remains largely in villages, primarily for seasonal temporary agricultural labour on a daily wage basis, while about 50% of households show no recorded migration activity.

10.2.8 Social Participation

The majority of villagers surveyed have bank account and access to Self-Help Groups (SHGs). When examining the frequency of involvement, it became evident that most respondents are neither members of nor actively participating in any social organizations. Consequently, there is a low incidence of social engagement.

10.2.9 Issue Recognition (Collected Through Focus Group Discussions with Farmers)

- Farmers in low-literacy villages, namely Vadeshwar, and Sawale, are seeking a farming training program as part of a watershed development plan.
- There is less awareness in the village's farmers about technical information and government policies.
- About 60% of the households surveyed include marshals and smallholders who are located on less than 5 acres of land. Therefore adoption of mechanization is not the pattern in the area.

- Study area villages, Vaijanath, Bhivpuri (camp), Mandawane and Humgaon villages are prone to soil erosion due to factors such as slope, rainfall intensity, and land use practices. Farmers have expressed concerns about soil erosion, which can result in the loss of fertile topsoil, reduced crop productivity, and sedimentation of water bodies.
- In the study area, while some villages experience satisfactory groundwater levels, many others encounter challenges such as frequent hand pump failures and low groundwater in the upper reservoir area. This is particularly evident in the village, namely Sawale, Khand, and Malegaon Bk. of the proposed PSP project site.
- Poor irrigation in project region has resulted in low crop yields, emphasizing the urgent requirement for better water management practices in the Khand, Sawale, and Malegaon Kh. villages.
- Farmers in the area lack access to a cooperative marketing milk collection system, leading them to rely on local private milk dairies for selling their milk.
- In the region, water conservation efforts are good, but 40% of farmers face soil erosion, and 30% experience water shortage for irrigation. To address this, implementing measures like (TCB) Trench cum Bund, Borewell recharge filters, and Farm ponds at specific sites as per farmers' needs is recommended.

11.0 WATERSHED MANAGEMENT TREATMENT PLAN

11.1 Area to be taken up for Treatment

Area under severe and very severe erosion intensity category in all the 9 Sub-watersheds will be taken up for treatment. To arrive at such an area, first of all areas under severe and very severe erosion intensity category was extracted for each Sub-watershed, which comes out to be **12353.02 ha.** Thereafter, area under severe and very severe erosion intensity category falling above 45 degree of slopes were extracted as it is not feasible to implement treatment measures in the area having slope more than 45 degree. Finally, areas under severe and very severe erosion intensity category falling under scrub land and fallow land classes of land use/ land cover have been selected for treatment as forest department under various schemes is already implementing treatment measures in the forest areas therefore, in order to treat non forest land scrub land fallow land have been selected for treatment. The Sub-watershed wise and land use/ land cover wise area thus arrived at and considered as treatable area is **3838.51 ha (or say 3838 ha)** and is presented below in **Table 12.**

Table 12: Sub-watershed wise treatable area in Study Area

Sub-Watershed	Scrub Land	Fallow Land	Total Area (ha)
4D7F8s	357.53	34.75	**392.28**
4D7F8u	700.52	208.65	**909.17**
4D7F9h	699.72	73.62	**773.34**
5B2B7g	315.71	51.01	**366.72**
5B2B7h	173.57	34.68	**208.25**
5B2B7j	64.92	25.93	**90.85**
5B2B7k	212.44	20.24	**232.68**
5B2B7n	635.06	7.87	**642.93**
5B2B7p	208.27	14	**222.27**
Total	**3367.8**	**470.75**	**3838.51**

11.2 Treatment Measures

Watershed management is the optimal use of soil and water resources within a given geographical area so as to enable sustainable production. It implies changes in land use, vegetative cover, and other structural and non-structural action that are taken in a Sub-watershed to achieve specific Sub-watershed management objectives. The overall objectives of Sub-watershed management programme are to:

- increase infiltration into soil;
- control excessive runoff;
- manage & utilize runoff for useful purpose.

11.2.1 Biological Measures

The biological measures would comprise of:

- Normal Afforestation
- Assisted Natural Regeneration
- Energy Plantation

11.2.1.1 Normal Afforestation

It is proposed to increase the vegetation cover in the tract. For this, patches of scrub land falling under severe and very severe erosion intensity category shall be brought under afforestation. The locality factors prevalent in the area such as fires, grazing etc. are fairly adverse to the establishment of plantations. Thus, special and intensive efforts are needed to ensure the success of afforestation work. Owing to these factors, the plantation will require higher levels of maintenance also. This will include raising of multi-tier mixed vegetation of suitable local species. 1111 plants per hectare will be planted under this scheme. Planting will be done in pits. Earth work should be done well in advance. Plants should be healthy with strong stems. Planting should be done in June when the water supply starts. Further, it is assessed that it is essential to make provision for soil and moisture conservation measures in the areas proposed for afforestation. Provision had been made for undertaking various necessary soil and moisture conservation measures in these areas. Provision is also made for five years maintenance of afforestation undertaken as part of the watershed management. The unit cost for afforestation including maintenance cost for five years is estimated to be Rs 6,28,030/- per ha. The detailed estimate is sourced from the Rate Structure for Compensatory Afforestation Model No. 5 prepared by the Nanded Forest Division. The detailed cost norm thus prepared after making necessary changes and adopting current wage rate is furnished in **Annexure-II**. The area to be brought under afforestation **57 ha**.

11.2.1.2 Assisted Natural Regeneration

In certain areas, conditions are conducive to natural regeneration provided some sort of assistance is provided. Such area shall be taken up under this component. The areas shall be closed to reduce biotic interference. Ground surface will be cleared of slash, debris and felling refuse to afford a clean seed bed to the falling seed. At certain places some soil raking may also have to be done to facilitate germination of seeds. Where natural regeneration is found deficient. It will be supplemented by artificial planting. Patch sowing in suitable areas may also be done. 625 plants per hectare will be planted under this scheme. The plantation will be maintained for subsequent five years. The unit cost for aided natural regeneration including

maintenance cost for five years is estimated to be Rs. 3,66,840 per ha. The detailed estimate is furnished in **Annexure-II**. The area to be brought under aided natural regeneration is **84 ha**.

11.2.1.3 Agroforestry (Energy Plantation)

Sustainable agriculture depends on agro ecological process that promote soil fertility and past resistance through biologically acquired inputs and social process that generate knowledge and incentives for producing a variety of foods and fibers within locally affordable means. Agroforestry practice, the cultivation of tress or other woody plants with crops for multiple benefits can contribute substantially to advancing a sustainable agriculture through its influence on ecological and social process. One of the major types of agroforestry system proposed under this Sub-watershed development and management plan is Energy Plantation. Energy plantation scheme, one of the major types of Agroforestry system is essential for a continuous supply of fuel and fodder. It can be easily carried out and it is economical to carry out. Fallow land falling under severe and very severe erosion intensity category will be used for energy plantation. Additionally, bunds of agricultural lands can also be utilized for agroforestry (energy plantation). However, plantation on the bunds of the agricultural lands will be carried out only after consultation with concerned farmers. Under this present scheme 1111 plants per hectare will be planted. The plantation will be maintained for subsequent three years. The unit cost for aided natural regeneration including maintenance cost for five years is estimated to be Rs. 3,66,840 per ha. The detailed estimate is furnished in **Annexure-II**. The area to be brought under aided natural regeneration is **46 ha**.

11.2.2 Engineering Measures

The engineering treatment measures require less time to be put in place and can provide quick solutions. These would comprise mainly of continuous contour trenches, brushwood check dams, Dry stone masonry check dams (as shown in **Annexure-I**)/ walls, farm ponds and water harvesting structures.

11.2.2.1 Continuous Contour Trench

A continuous contour trench is dug at a right angle to the slope and are planned along contour lines. The water that percolates into these trenches after a rainfall, keeps the soil moisture intact for a long time that may even extend up the following dry season. The same water can be directly pumped out for irrigation or extracted from shallow wells in the area. Without trenches, a lot of soil erosion happens which increases the salt buildup in the water downstream. This becomes unfavourable for groundwater quality as well as for crops. Also, the roots and foliage of the vegetation trap sediment that would otherwise overflow from the trench during heavy rainfall. Any pollutants other than salts that may have mixed during the runoff are also contained within these trenches without getting concentrated and accumulating downstream. Runoff happens when rainfall intensity exceeds the ability of the soil to absorb and transmit rain-water. The detailed estimate is furnished in **Annexure-II**. The area to be brought under continuous contour trench is **215 ha**.

11.2.2.2 Brushwood Check Dams

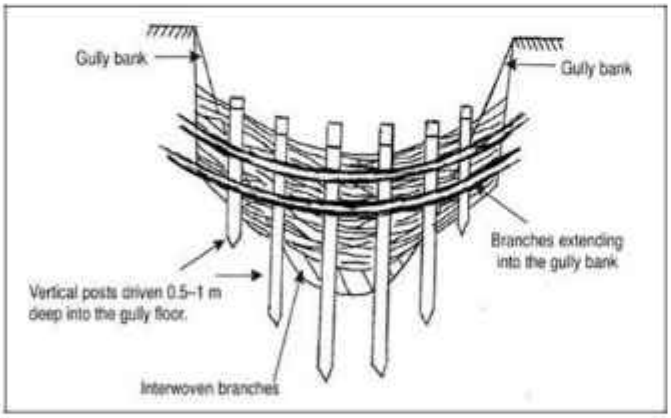
Brushwood check-dams made up of posts and brushes are placed across the gully. The main objective of brushwood check-dams is to hold fine materials carried by flowing water in the gully. Small gully heads, can also be stabilized by brushwood check dams. The main requirement

of brushwood check dam is that, they must be quick and easy to construct, should be made by using cheap and readily available material in nearby areas. In areas where the soil in the gully is deep enough, brushwood check dams can be used if proper construction is assured. The gradient of the gully channel may vary from 5 to 12 percent, but the gully catchment area should not be as such huge which produces high amount of runoff volume. There are two types of brushwood check-dams: these are single row and double row brush wood check-dams. The type chosen for a particular site depends on the amount and kind of brush available and on the rate and volume of runoff. The maximum height of the dam is one meter from the ground (effective height). The number of brushwood check dam suggested are **530 nos**.

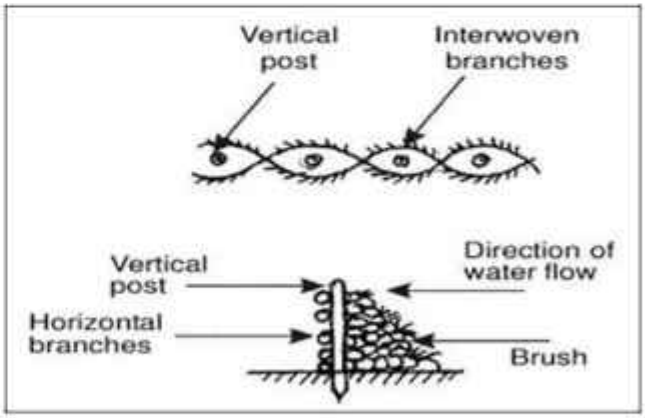
a. Single Row Brushwood Check-dams

These check-dams can be used where the rate of runoff is less than 0.5 m3/sec. The structure is temporary and its durability will depend on the quality of posts used. If possible live posts of willow, popular and other trees should be used (8-10 cm dia). Flexible branches are cut and woven around the posts. This dam is constructed across the channel or gully with the brush wood materials, laid along the flow of water, keeping the butt ends towards u/s face of the gully. The brushwood is kept in position by tying to the posts. Before the dam construction is begun, the sides of the gully or channel should be sloped to 1:1 and the gully bed should also be excavated for 15 cm depth along the entire gully width over which brushwood have to be laid. In addition, 15 cm excavation is also done into the bank to give necessary notch capacity.

After excavation, the wooden posts of about 10 cm in diameter are driven in a line across the gully at an interval of 90 cm up to a depth of 75 cm in gully bed. The top of wooden posts should be kept at such a height so as to form a notch of required size. The brushwood is tied from the front line and the other lines are tied using galvanized wire for keeping them in position. The lowest layer of the brushwood must be the longest.



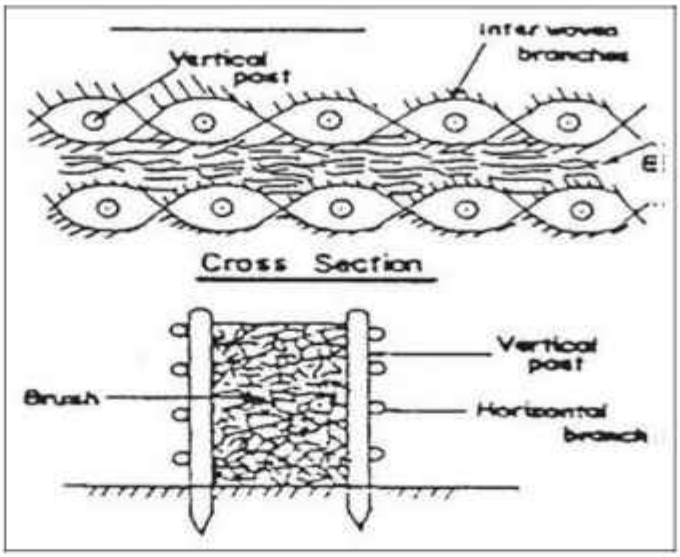
A single row brushwood check-dam front view



Vertical and side views of single row check-dam

b. Double Row Brushwood Check-Dam

This type of brushwood check-dam is suited where the rate of runoff is less than 1 m3/sec. The construction of the dam starts with an excavation in the floor and into the sides of the gully to a depth of 0.3-0.5 m. Two rows of posts, 5-10 cm in diameter and 1-2 m in length are placed into the holes, across the floor of the gully to a depth of 0.5-0.6 m. The spacing between the posts is 0.5 m. Brushwood or branches are packed between the posts. The height of the posts in the center should not exceed the height of the spillway otherwise the flow will be blocked and water may be forced to move to the gully sides.



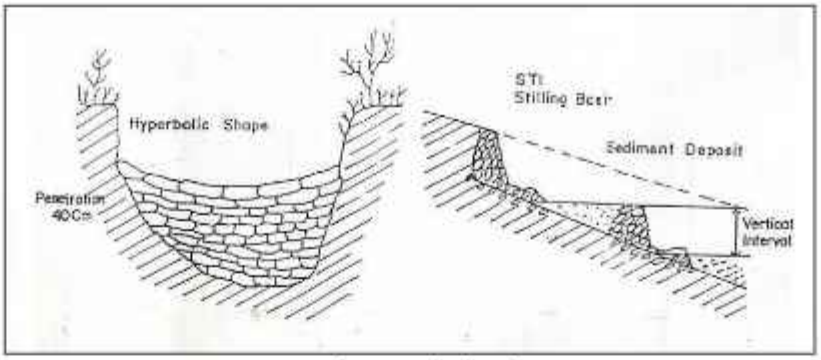
Double row brush wood check-dam

11.2.2.3 Dry Stone Masonry Check Dam

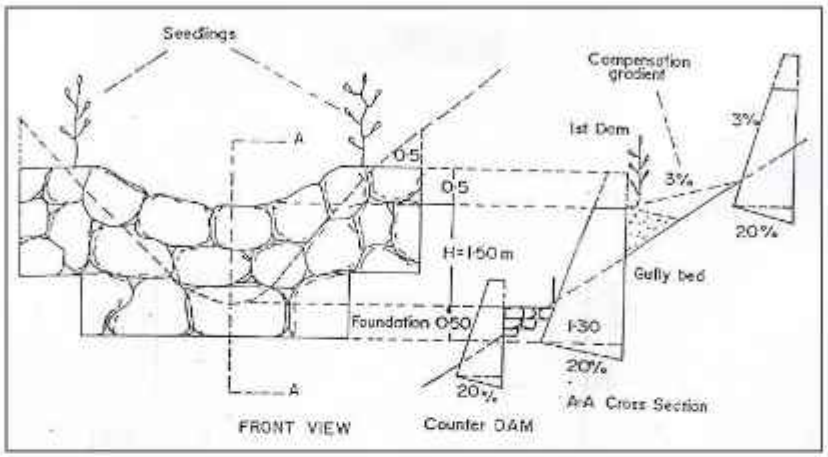
Larger gullies have to be treated to prevent further deepening and widening. The purpose of a check dam is to reduce the gradient and reduce the flow velocity. The water is guided safely from a higher elevation to a lower elevation without causing erosion at the gully/nala bed and banks. The water pools behind the dam promotes the percolation into the soils.

The ideal spacing of check dam should be such that the bottom of the upper check dam is in the level with the top of the next lower one. In steep areas, this is difficult to achieve as it may require too many check dams. Check dam must be well anchored to prevent under scouring and scouring between the dam and the banks. The flow is directed through a water or water spill in the centre of the dam, at the point of impact of the bed, a protective apron must be constructed to dissipate the energy.

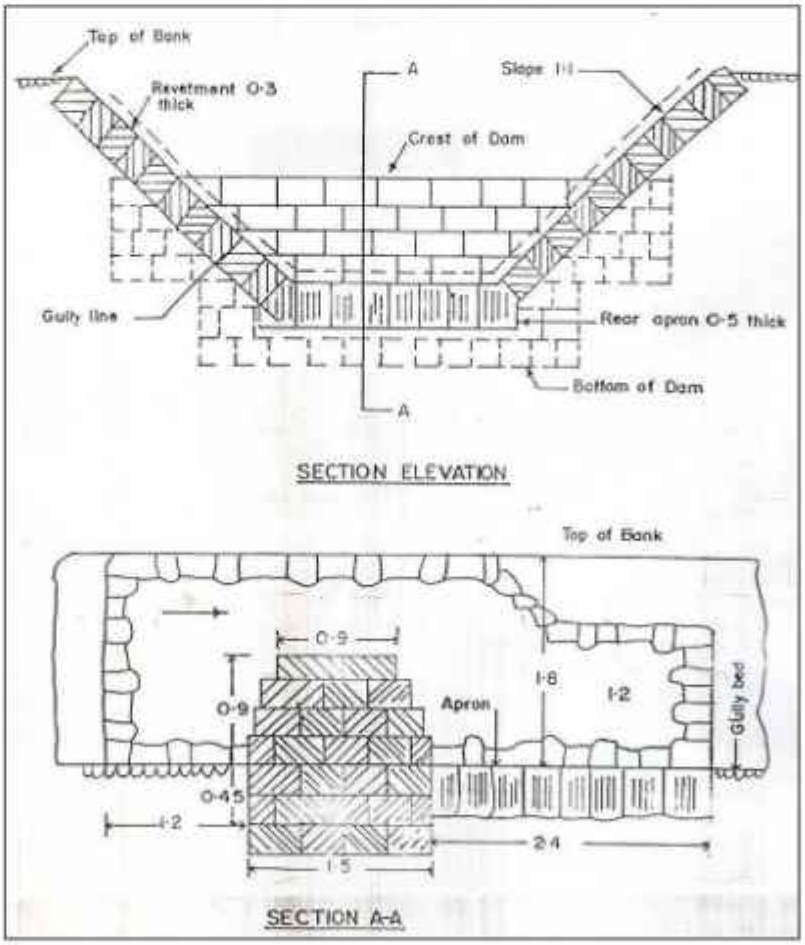
Masonry Check Dams are the most commonly used structures both in case of larger gullies and small nalas/ stream. These are generally constructed in upper reaches of eroding nallahs to reduce the bed slope, stabilize the grade and check the bed scouring and retain silt, sand and pebbles. The depth of the foundation may vary from 30-60 cm. Foundation should be dug across the nala width extending well into the banks. The larger stones are placed in bottom layers. In every of stones, a step of 15 to 20 cm is left on the downstream side, so that the width is reduced from base to top. Two wing walls with appropriate foundations are often constructed at the upper side to force the flow into the water spills or notch and to prevent it from damaging the banks. The wing walls should form an angle of about 30 degree with the banks. Below the dam an apron has to be constructed with stones. On the upstream side, the dam has to get an earth fill for greater strength. The structure is supplemented by planting seedlings and cutting of suitable species along the banks on the upstream side. The number of dry stone masonry check dams suggested are **145 nos.**



Layout of Typical Check Dam



Layout of Loose Stone Check Dam



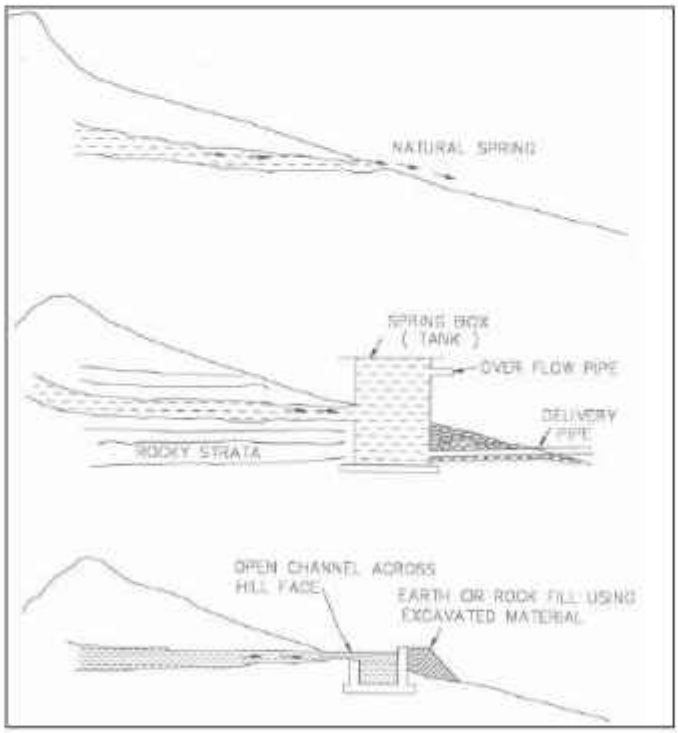
Layout of Dry Stone Check Dam

11.2.2.4 Water Harvesting Structure

The demand on the water resources has been increasing with every passing year. The state is faced with a situation of water stress i.e. manifested by apparent moisture stress in vegetation and forest. Keeping in view of these facts water harvesting structures are proposed in the present Watershed Management Plan to conserve and augment water resources. The basic idea is to trap rain water on hill sides, increase percolation and to build water retaining structures to store the excess water runoff in streams. If runoff is collected locally at appropriate locations in water harvesting structures, not only it can be gainfully utilized subsequently, but it will also help in reducing the volume of runoff in streams during monsoon and subsequently reduce the soil erosion. Types of water harvesting structures are illustrated below. However, component and design is to be followed as direction given by the concerned department from time to time and as per availability and requirement of the site. In the present plan, one water harvesting structure is proposed in each inhabited sub-watershed having more than one village. The number of water harvesting structures suggested are **9 nos.**

a. Spring Water Harvesting

Lined channels are built across the hill slopes to intercept rain water. These channels convey water for irrigation terraced agricultural fields. The water is also used to fill small ponds for domestic use and the cattle. Generally, water from hill streams are diverted through small excavated channels. A typical spring water harvesting system is shown in Figure below:



Typical Spring Water Harvesting System

One relatively easy means of storing and distributing spring water is through a device known as a spring box. Built usually into a hillside and deep enough to access the spring-water source, this device allows water to enter from the bottom (as depicted in Figure above) and fill upto a level established by an overflow or vent pipe. Hydraulic pressure then maintains the level in the spring box. The outflow pipe near the base of the device may be connected via pipe to a larger storage system (such as a tank) closer to the point of use or tapped directly at the location of

the box. This device can be constructed using local materials. Depending on local water requirements and conditions, a number of these spring boxes may be constructed to provide year-round supply or used to recharge other community water storage systems.

b. Polylined Tanks

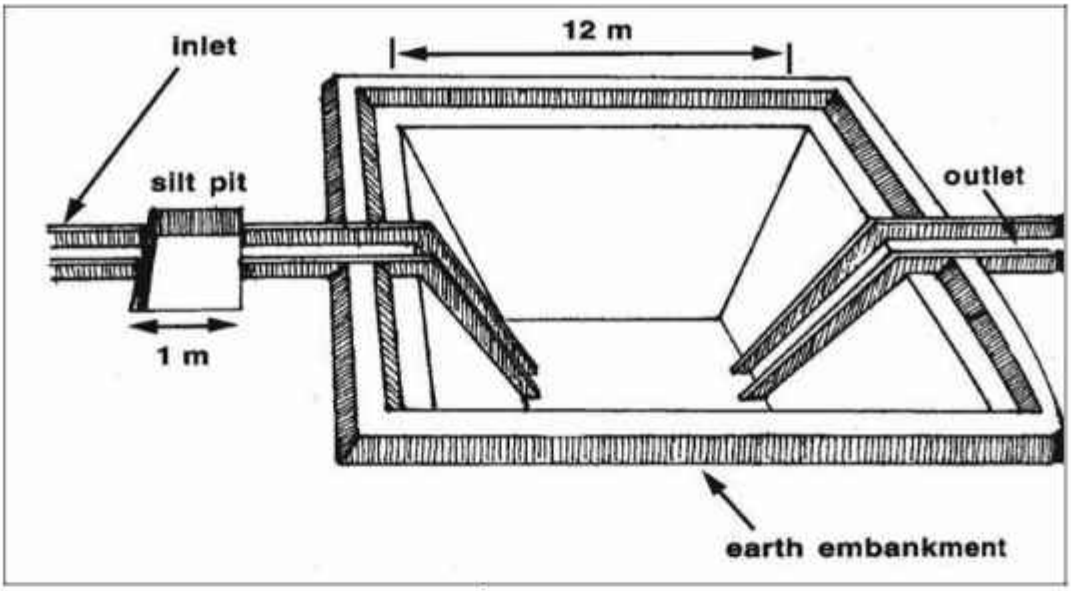
Polylined tanks suggested in study area are trapezoidal shaped having depth of 1.5 m, length of 10 m and width of 6 m at bottom each and side slopes of 1:1. For lining the tank, a blue colored UV stabilized, multi-layered cross-laminated sheets may be used. The construction activities involve digging the tank in trapezoidal shape, smoothening and levelling the four walls as well as base of the tank, spraying of weedicide, sheet laying and brick lining (completely loose, without any cementing material). If small pebbles are present on the walls and bottom, try to remove them completely, else there are chances of the sheet getting damaged. If the need be, the walls and the base may be levelled by spreading the fine screened soil. The size of the sheet should be obtained by actually measuring the cross dimensions i.e. length and width of the already dug out tank including 85 cm of sheet which needs to be buried at the top outer ends of the tanks. Normally the storage capacity of a tank with this dimension is between 70000 – 75000 litre. A typical polyined tank is shown in Figure below:

Preparation of polylined tank

Rain water harvested in polylined tank

11.2.2.5 Farm Ponds

The ideal farm pond should be dug into the ground in a naturally low-lying area. Some of the soil that is removed can be used to construct an earthen berm around the pond, which should be planted with trees and grasses for stability. The shade and wind protection provided by the raised mound and vegetation will reduce evaporative losses. Greater depth of the pond and less surface area will also reduce evaporative losses. However, digging deeper than 5 meters will increase the expense of the digging, and increase seepage loss due to increased water pressure on the ground. The pond should have an inlet and an outlet lined with rock to prevent erosion. These features will need to be linked into a larger drainage plan which directs water into the pond, and receives any overflow water. A small settling pit at the inlet will help remove silt, and can be more easily cleaned than the whole pond. The sides of the pond should be sloped for stability. In the present plan, five farm ponds are proposed in each subwatershed, and thus, the number of farm ponds suggested are **45 nos.**



Excavated/dugout Farm Pond

12.0 OTHER INTERVENTIONS

12.1 Improved Agronomic Practices and Environmental Services

Encouragement for improved agronomic and environmental services is a concept for good conservation behaviour to the community living in the watersheds. It is a tool to incentivize the local communities for sustainable and environmentally friendly use of the catchment. Encouragement for improved agronomic and environmental services programs pay users to conduct environmentally friendly initiatives or to give up destructive practices. The general criteria to a successful system includes (i) voluntary transactions, (ii) well-defined Environmental Service, which in present case are all the measures that will reduce soil erosion; (iii) buyer for Environmental Service, which in present case is local community; (iv) seller for Environmental Service, which in present case is rural development/Panchayati Raj department; and (v) payment is conditional upon receiving Environmental Service which in present case will be followed as per the norms of department. A lumpsum provision of **Rs. 15.00 lakh** has been kept for the purpose.

Some of the activities proposed under Encouragement for improved agronomic and environmental services are as follows:

- **Incentive for freezing of land use:** Since frequent change in land use make the soil strata loose and prone to erosion, e.g., removal of stones loosen up the soil. Effective conservation measures to protect the existing land use require participation of local communities. Therefore, it is proposed to provide incentive to the community and land owners who freeze and maintain the existing land use pattern of community forest, grasslands, fodder, agriculture land and orchards for long period of time to maintain the ecological balance.

- **Incentive for survival of plantation:** Forest cover can only increase if the survival percentage of the plants planted in the various plantation activities carried out is good. Survival incentives systems for tree plantations are an important instrument to create renewable resources through credible mechanisms to encourage community participation in conservation efforts.

- **Incentive for reduction of biotic pressure:** The human dependency on forest has led to continuous degradation of ecosystem. It is necessary to encourage community for agroforestry and joint forest management practices to reduce biotic pressure of ecosystem services.

- **Incentive for maintenance & improved water resources:** It is utmost important to maintain and improve water resources. Also, it becomes important to conserve the recharges zone of these water resources. In addition, since water resources such as water harvesting structures, farms ponds have been suggested in the present plan therefore, maintenance of these resources also becomes necessary.

- **Incentive for rotational grazing:** Awareness among the community becomes necessary to avoid environmental hazards due to over grazing. Rotational grazing is one the option to deal with consequences of overgrazing. Rotational grazing refers to dividing the grazing

into two parts, one to remain closed and other one to be used. This will allow the parts to rejuvenate in tandem.

- **Incentive for organic farming in private land:** Organic farming is a production system which avoids or largely excludes the use of synthetically compounded fertilizers, pesticides, growth regulators, genetically modified organisms and livestock food additives. The impact of organic farming on natural resources favours interactions within the agro-ecosystem that is vital for both agricultural production and nature conservation. At the ecosystem level, the maintenance of natural areas within and around organic fields and absence of chemical inputs create suitable habitats for wild flora and fauna. Awareness and encouragement are required among the farmers to adopt the organic farming practices. Therefore, Incentive for farmers practicing certified organic farming is an important tool to motivate farmers towards organic farming.

12.2 Research, Training, Capacity Building and Livelihood Enhancement

The component includes Participatory Action Research for site/issue specific research/study/survey. Such studies can be undertaken by either Rural Development/Panchayati Raj Department or any recognized Law University in India. Capacity building shall be an integral part of such studies. A lumpsum provision of **Rs. 13.40 lakh** has been kept for the purpose.

To address the lack of knowledge among farmers regarding improved cultivation practices, a skill development training program is proposed, covering various relevant topics.

- Propose a comprehensive training program for residents of low-literacy villages—Sawale, and Vadeshwar —aimed at enhancing agricultural skills and capacities. This program will be a vital component of the watershed development plan, focusing specifically on farming techniques and practices to empower local farmers.
- Propose targeted capacity-building programs in watershed areas to promote the adoption of mechanization, focusing on small landholders with less than 5 acres, to enhance their skills and awareness in four villages, namely Sawale, Humgaon, Khand, and Pimpari.
- Implementing a comprehensive soil conservation program involving terracing, afforestation, and sustainable land management practices to mitigate soil erosion in watershed areas such as Vaijanath, Bhivpuri, and Humgaon villages.
- Implementing diversified irrigation techniques and establishing resilient crop varieties to mitigate the impact of inconsistent water availability on crop yield in watershed areas.
- Implement training programs for local communities across the watershed area, with a focus on sustainable water management practices. The goal is to address declining groundwater levels, reduce hand pump failures, and ensure water security in the upper radius villages, namely Sawale, Khand, and Malegaon Bk, as part of the proposed project site.
- Implementing comprehensive training programs on efficient irrigation techniques and water management practices in the villages of Khand, Sawale, and Malegaon Kh. within the study area to enhance agricultural productivity and address challenges related to poor irrigation and low crop yields.

- Implement capacity-building activities in the rural area to establish a cooperative marketing milk collection system, empowering farmers to reduce dependence on local private dairies for milk sales.
- Proposed activities for capacity building in rural areas include training farmers on implementing soil conservation techniques like Trench cum Bund (TCB), installing Bore well recharge filters, and constructing Farm ponds tailored to their specific needs, aiming to address soil erosion and water scarcity for irrigation.
- To enhance livelihoods, the developer should promote eco-tourism and support local markets by creating designated areas for farmers and artisans to sell their goods to tourists. Additionally, improving infrastructure and marketing the unique cultural and natural attractions of Thokarwadi Dam could attract more visitors, thereby increasing the income of the local community.
- To enhance livelihoods, promoting sustainable harvesting practices and value addition to forest products such as firewood, mangoes, berries and honey could be beneficial. Training villagers in these practices and facilitating direct market access or cooperative marketing in the Karjat and Vadeshwar markets will help increase their income and ensure long-term availability of these resources.
- To enhance livelihoods in the area, support for flower and poultry farming should be increased through market access initiatives and skill development programmes, especially targeting women groups involved in poultry farming in the study area. Encouraging agro-tourism and value-added products can increase income opportunities for villagers.

12.3 Monitoring and Evaluation

Monitoring and evaluation is an integral part of the plan where efficacy is assessed regarding implementation of rehabilitation measures. It is proposed to carry out monitoring through a third-party agency using following two methods:

- Physical inspection
- Satellite data-based monitoring

Frequency of such monitoring could be every six months. For the online and offline monitoring, a provision of **Rs. 10.00 lakh** has been made.

13.0 COST ESTIMATE

The estimated cost of implementation of watershed development and management plan for the study area as defined above is **Rs. 811.6386 lakh** and is given at **Table 13**.

Table 13: Estimated Cost of Watershed Development and Management Plan Implementation in Study Area

S. No.	Item	Rate (Rs)	Unit	Target	
				Physical	Financial (Rs)
I	**Biological Measures**				
1	Normal Afforestation	4,79,480	ha	57	2,73,30,360.00
2	Assisted Natural Regeneration	3,66,840	ha	84	3,08,14,560.00
3	Agroforestry (Energy Plantation)	4,41,000	ha	46	2,02,86,000.00
	Sub Total I				**5,11,00,560.00**
II	**Engineering Measures**				

S. No.	Item	Rate (Rs)	Unit	Target	
				Physical	Financial (Rs)
5	Continuous Contour Trench (CCT)	92,820	ha	215	1,99,56,300.00
6	Brushwood Check Dams	2,000	No	530	10,60,000.00
7	Check Dams (DRSM)	26,600	No	145	38,57,000.00
8	Water Harvesting Structure	1,00,000	No	9	9,00,000.00
9	Farm Pond	10,000	No	45	4,50,000.00
	Sub Total II				**2,62,23,300.00**
III	**Improved Agronomic practices and Environmental Services**	Lumpsum			**15,00,000.00**
IV	**Research, Training, Capacity Building and Livelihood Enhancement**				
1	Training program to low-literacy level village on farming techniques	50,000	No	2	1,00,000.00
2	training programs on efficient irrigation techniques and water management practices in the villages	25,000	No	4	1,00,000.00
3	To implement training programs for local communities and sustainable water management in the villages.	50,000	No	3	1,50,000.00
4	Training farmers in diversified irrigation methods and promoting resilient crop varieties for improved yield in the study area.	25000	No	6	1,50,000.00
5	Organization of awareness and skill of small landholders with less than 5 acres for enhance agricultural productivity and address the challenges of poor irrigation and low crop yields	37,500	No	4	1,50,000.00
6	Train on good animal husbandry practices and establish a cooperative milk collection system for marketing in the study area	25,000	No	4	1,00,000.00
7	Training farmers in implementing soil conservation techniques like Trench cum Bund (TCB), installing Bore well recharge filters, and constructing Farm ponds tail to their specific needs, aiming to address soil erosion and water scarcity for irrigation	37,500	No	4	1,50,000.00
8	Trainings on millet-based value addition and marketing to SHG in the villages	20,000	No	5	1,00,000.00
9	Promote eco-tourism and support local markets through infrastructure improvements and marketing at Thokarwadi Dam."	30,000	No	4	1,20,000.00
10	Promote sustainable harvesting practices and value addition to forest products through training and market access in Karjat and Vadeshwar."	20,000	No	4	80,000.00
11	Support for flower and poultry farming through market access initiatives, skill development programs for women	20,000	No	7	1,40,000.00

S. No.	Item	Rate (Rs)	Unit	Target	
				Physical	Financial (Rs)
	groups, agri-tourism and value-added products.				
	Sub Total IV				**13,40,000.00**
V	**Monitoring and evaluation**	Lumpsum			**10,00,000.00**
	Total Cost				**8,11,63,860.00**

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R. K. Goyal, M. A. Khan, T. K. Bhati, C. B. Pandey, M.M. Roy (2013), Watershed Management for Development of Hot Arid Zone of India, Central Arid Zone Research Institute (ICAR), Jodhpur

D. K. Sonowal and K. K. Satapathy, Integrated Watershed Development – A Sustainable Approach for Resource Conservation and Management, ICAR Research Complex for NEH Region, Umiam

ANNEXURE-I: FIELD VISIT PHOTOGRAPHS

Thokarwadi Dam

Immediate Downstream of Thokarwadi Dam

Thokarwadi Reservoir

Plantation Activities carried out by TPL near Intake Point




Sample Type of Terrain in the Watershed Area





Soil & Water Conservation and Water Harvesting Structures in the Watershed Area



Public Consultation

ANNEXURE-II

1. Per Hectare Model Rate Structure for Normal Afforestation

Spacement: 2m x 2m

Size of Pits: 0.45m x 0.45m x 0.45m

Mix Plantation

Wage Rate: Rs. 443.50 per day

No. of Seedlings: 1100

S. No.	Particulars of Works	Man Day	Wages	Material Supply	Total
A	**Pre Monsoon Works PPO/ PYO**				
1	(a) Survey and demarcation	1.00	443.50	91.00	534.50
	(b) Preparation of treatment map (100 m x 50 m grid)	1.00	443.50	91.00	534.50
	(c) Digging trial pits of size 0.30x0.30x0.60 in corner of Grid	0.40	177.40	0.00	177.40
	(d) Fixing 60cm x 0.05cm x 12cm cement pillars upto 30cm deep in corner of Grid, painting with Grid No. etc complete (3 pillars Rs. 75/- for each pillar)		0.00	225.00	225.00
	(e) Clearing of bushes and preparation of site (As per requirement)	10.00	4435.00	91.00	4526.00
2	Soil and moisture conservation works including collection of rubbles from areas upto 30m etc.	31.00	13748.50	0.00	13748.50
3	Providing and fixing chain link fencing, 102 Rmt per ha (with 1 gate + 2 wicket gates per site (Rs. 1494/- per Rmt of basic rate + 20% for transportation of average lead plus 20% for tribal/ remote area (by tender process) (Rs. 1494/- + 149 + 149 = 1792/- per Rmt (1.60 Rmt height with G.I. Chain link size 50mm x 50m, 8 gauge thick and fixed 75mm above ground level complete as per SSB item No. 1744 for 2017-18)	0.00	0.00	182865.60	182865.60
4	Alignment of pits at 2m x 2m spacement. 1111 pits per ha (0.25 per 100 pits and M&S @ Rs. 2.24 per 50 pits)	2.78	1232.93	49.77	1282.70
5	Digging of pits of size 0.45x0.45x0.45 (1111 pits per ha) 6.60 M.D. per 100 pits.	73.33	32521.86	0.00	32521.86
6	Construction of 5.00 Rmt. wide Inspection Path 1 M.D. per 100 Rmt.	1.00	443.50	0.00	443.50
7	Enumeration of all valuable plant species at plantation site and grid wise counting and providing colour band and recording the same in register 0.75 MD per 100 plants	0.75	332.63	25.00	357.63
8	Providing and fixing (4 feet x 3 feet) information board each per site	0.00	0.00	5000.00	5000.00
9	Part Nursery cost of raising 1333 seedlings per ha (including 20% casualty replacement) in polygons of size 12.50 x 25.00 cm (Wage Rs. 11.90 and M&S Rs. 3.62 per plant)	46.71	20715.89	4825.46	25541.35
	Total	**167.97**	**74494.70**	**193263.83**	**267758.53**
	Contingency 3%				**8032.76**
	Labour Welfare 4%				**10710.34**
	Grand Total				**286501.62**
B	**First Year Operations**				

S. No.	Particulars of Works	Man Day	Wages	Material Supply	Total
1	Part Nursery cost of raining 1333 seedlings per ha (Wage Rs. 2.97 and M&S Rs. 0.81 per plant)	14.80	6563.80	1079.73	7643.53
2	Refilling of pits by good quality soil including application of single super phosphate (1.66 MD per 100 pits)	18.44	8178.14	1944.25	10122.39
3	Transportation of 1333 seedling from Nursery to plantation site including loading & unloading (0.14 M.D. per 100 seedling & M.S. Rs. 1.82 per seedling)	1.87	829.35	2426.00	3255.35
4	Planting of 1111 seedlings (1.0 M.D. per 100 seedling)	11.11	4927.29	0.00	4927.29
5	3 weeding (1 Rmt circular) and 2 soil workings (4.00 M.D. per 100 seedlings) fertilizer application of Rs. 0.82 per seedlings	44.44	19709.14	911.02	20620.16
6	Casualty replacement (20% 222 seedlings per ha) (2 M.D. per 100 seedlings)	4.44	1969.14	0.00	1969.14
7	Part Nursery cost for casualty replacement in SYO (222 seedlings per ha) (wages Rs. 11.90 and material supply Rs. 3.62 total Rs. 12.55 per seedling)	7.77	3446.00	803.64	4249.64
8	Watch and ward (10 months - 1 watcher per 10 ha)	27.38	12143.03	0.00	12143.03
9	Fire tracing	2.00	887.00	0.00	887.00
	Total	**132.25**	**58652.88**	**7164.64**	**65817.52**
	Contingency 3%				**1974.53**
	Labour Welfare 4%				**2632.70**
	Grand Total				**70424.74**
C	**Second Year Operations**				
1	Part Nursery cost for seedlings casualty replacement (222 seedlings per ha) labour rate @ 3.77 and M.S. Rs. 1.82 per seedlings	2.46	1091.01	404.00	1495.01
2	Transportation of 222 seedlings for casualty replacement from nursery to plantation site (including loading and unloading) wages 0.14 M.D. per 100 seedlings & M.S. Rs. 1.82 per seedlings	0.31	137.49	404.04	541.53
3	Planting for casualty replacement 222 seedlings (2.0 M.D. per 100 seedling)	4.44	1969.14	0.00	1969.14
4	2 weeding and 1 soil workings with fertilizer application at 2.5 M.D. per 100 seedlings M.S. Rs. 0.82 per seedlings	27.77	12316.00	911.02	13227.02
5	Watch and ward (12 months - 1 watcher per 10 ha)	36.50	16187.75	0.00	16187.75
6	Fire tracing	2.00	887.00	0.00	887.00
	Total	**73.48**	**32588.38**	**1719.06**	**34307.44**
	Contingency 3%				**1029.22**
	Labour Welfare 4%				**1372.30**
	Grand Total				**36708.96**
D	**Third Year Operations**				
1	1 weeding and 1 soil workings (1.50 M.D. per 100 seedlings) fertilizer application of Rs. 0.82 per plant	16.67	7393.15	911.02	8304.17
2	Watch and ward (12 months - 1 watcher per 10 ha)	36.50	16187.75	0.00	16187.75
3	Counting of survival percentage Grid wise and Species wise and to Note the same on Register in May and October	2.00	887.00	25.00	912.00
4	Fire tracing	2.00	887.00	0.00	887.00

S. No.	Particulars of Works	Man Day	Wages	Material Supply	Total
	Total	**57.17**	**25354.90**	**936.02**	**26290.92**
	Contingency 3%				**788.73**
	Labour Welfare 4%				**1051.64**
	Grand Total				**28131.28**
E	**Fourth Year Operations**				
1	Watch and ward (12 months - 1 watcher per 10 ha)	36.50	16187.75	0.00	16187.75
2	Counting of survival percentage Grid wise and Species wise and to Note the same on Register in May and October	2.00	887.00	25.00	912.00
3	Fire tracing	2.00	887.00	0.00	887.00
	Total	**40.50**	**17961.75**	**25.00**	**17986.75**
	Contingency 3%				**539.60**
	Labour Welfare 4%				**719.47**
	Grand Total				**19245.82**
F	**Fifth Year Operations**				
1	Watch and ward (12 months - 1 watcher per 10 ha)	36.50	16187.75	0.00	16187.75
2	Counting of survival percentage Grid wise and Species wise and to Note the same on Register in May and October	2.00	887.00	25.00	912.00
3	Fire tracing	2.00	887.00	0.00	887.00
	Total	**40.50**	**17961.75**	**25.00**	**17986.75**
	Contingency 3%				**539.60**
	Labour Welfare 4%				**719.47**
	Grand Total				**19245.82**
G	**Sixth Year Operations**				
1	Watch and ward (12 months - 1 watcher per 10 ha)	36.50	16187.75	0.00	16187.75
2	Counting of survival percentage Grid wise and Species wise and to Note the same on Register in May and October	2.00	887.00	25.00	912.00
3	Fire tracing	2.00	887.00	0.00	887.00
	Total	**40.50**	**17961.75**	**25.00**	**17986.75**
	Contingency 3%				**539.60**
	Labour Welfare 4%				**719.47**
	Grand Total				**19245.82**

Abstract

S. No.	Year of Operation	Man days	Wages	Material Supply	Total	Other Expenses	Total Amount	Or Say
1	Pre Monsoon Works	167.97	74494.70	193263.83	**267758.53**	18743.10	**286501.62**	**286500.00**
2	First Year Operation	132.25	58652.88	7164.64	**65817.52**	4607.23	**70424.74**	**70420.00**
3	Second Year Operation	73.48	32588.38	1719.06	**34307.44**	2401.52	**36708.96**	**36710.00**
4	Third Year Operation	57.17	25354.90	936.02	**26290.92**	1840.36	**28131.28**	**28130.00**
5	Fourth Year Operation	40.50	17961.75	25.00	**17986.75**	1259.07	**19245.82**	**19240.00**
6	Fifth Year Operation	40.50	17961.75	25.00	**17986.75**	1259.07	**19245.82**	**19240.00**
7	Sixth Year Operation	40.50	17961.75	25.00	**17986.75**	1259.07	**19245.82**	**19240.00**
	Total	**552.37**	**244976.10**	**203158.55**	**448134.65**	**31369.43**	**479504.07**	**479480.00**

2. Per Hectare Model Rate Structure for Energy Plantation

Spacement: 2m x 2m **Wage Rate: Rs. 443.50 per day**

Size of Pits: 0.45m x 0.45m x 0.45m **No. of Seedlings: 1100**

Mix Plantation

S. No.	Particulars of Works	Man Day	Wages	Material Supply	Total
A	**Pre Monsoon Works PPO/ PYO**				
1	(a) Survey and demarcation	1.00	443.50	91.00	534.50
	(b) Preparation of treatment map (100 m x 50 m grid)	1.00	443.50	91.00	534.50
	(c) Digging trial pits of size 0.30x0.30x0.60 in corner of Grid	0.40	177.40	0.00	177.40
	(d) Fixing 60cm x 0.05cm x 12cm cement pillars upto 30cm deep in corner of Grid, painting with Grid No. etc complete (3 pillars Rs. 75/- for each pillar)		0.00	225.00	225.00
	(e) Clearing of bushes and preparation of site (As per requirement)	10.00	4435.00	91.00	4526.00
2	Soil and moisture conservation works including collection of rubbles from areas upto 30m etc.	31.00	13748.50	0.00	13748.50
3	Providing and fixing chain link fencing, 102 Rmt per ha (with 1 gate + 2 wicket gates per site (Rs. 1494/- per Rmt of basic rate + 20% for transportation of average lead plus 20% for tribal/ remote area (by tender process) (Rs. 1494/- + 149 + 149 = 1792/- per Rmt (1.60 Rmt height with G.I. Chain link size 50mm x 50m, 8 gauge thick and fixed 75mm above ground level complete as per SSB item No. 1744 for 2017-18)	0.00	0.00	182865.60	182865.60
4	Alignment of pits at 2m x 2m spacement. 1111 pits per ha (0.25 per 100 pits and M&S @ Rs. 2.24 per 50 pits)	2.78	1232.93	49.77	1282.70
5	Digging of pits of size 0.45x0.45x0.45 (1111 pits per ha) 6.60 M.D. per 100 pits.	73.33	32521.86	0.00	32521.86
6	Construction of 5.00 Rmt. wide Inspection Path 1 M.D. per 100 Rmt.	1.00	443.50	0.00	443.50
7	Enumeration of all valuable plant species at plantation site and grid wise counting and providing colour band and recording the same in register 0.75 MD per 100 plants	0.75	332.63	25.00	357.63
8	Providing and fixing (4 feet x 3 feet) information board each per site	0.00	0.00	5000.00	5000.00
9	Part Nursery cost of raising 1333 seedlings per ha (including 20% casualty replacement) in polygons of size 12.50 x 25.00 cm (Wage Rs. 11.90 and M&S Rs. 3.62 per plant)	46.71	20715.89	4825.46	25541.35
	Total	**167.97**	**74494.70**	**193263.83**	**267758.53**
	Contingency 3%				**8032.76**
	Labour Welfare 4%				**10710.34**
	Grand Total				**286501.62**
B	**First Year Operations**				

S. No.	Particulars of Works	Man Day	Wages	Material Supply	Total
1	Part Nursery cost of raining 1333 seedlings per ha (Wage Rs. 2.97 and M&S Rs. 0.81 per plant)	14.80	6563.80	1079.73	7643.53
2	Refilling of pits by good quality soil including application of single super phosphate (1.66 MD per 100 pits)	18.44	8178.14	1944.25	10122.39
3	Transportation of 1333 seedling from Nursery to plantation site including loading & unloading (0.14 M.D. per 100 seedling & M.S. Rs. 1.82 per seedling)	1.87	829.35	2426.00	3255.35
4	Planting of 1111 seedlings (1.0 M.D. per 100 seedling)	11.11	4927.29	0.00	4927.29
5	3 weeding (1 Rmt circular) and 2 soil workings (4.00 M.D. per 100 seedlings) fertilizer application of Rs. 0.82 per seedlings	44.44	19709.14	911.02	20620.16
6	Casualty replacement (20% 222 seedlings per ha) (2 M.D. per 100 seedlings)	4.44	1969.14	0.00	1969.14
7	Part Nursery cost for casualty replacement in SYO (222 seedlings per ha) (wages Rs. 11.90 and material supply Rs. 3.62 total Rs. 12.55 per seedlings)	7.77	3446.00	803.64	4249.64
8	Watch and ward (10 months - 1 watcher per 10 ha)	27.38	12143.03	0.00	12143.03
9	Fire tracing	2.00	887.00	0.00	887.00
	Total	**132.25**	**58652.88**	**7164.64**	**65817.52**
	Contingency 3%				**1974.53**
	Labour Welfare 4%				**2632.70**
	Grand Total				**70424.74**
C	**Second Year Operations**				
1	Part Nursery cost for seedlings casualty replacement (222 seedlings per ha) labour rate @ 3.77 and M.S. Rs. 1.82 per seedlings	2.46	1091.01	404.00	1495.01
2	Transportation of 222 seedlings for casualty replacement from nursery to plantation site (including loading and unloading) wages 0.14 M.D. per 100 seedlings & M.S. Rs. 1.82 per seedlings	0.31	137.49	404.04	541.53
3	Planting for casualty replacement 222 seedlings (2.0 M.D. per 100 seedling)	4.44	1969.14	0.00	1969.14
4	2 weddings and 1 soil workings with fertilizer application at 2.5 M.D. per 100 seedlings M.S. Rs. 0.82 per seedlings	27.77	12316.00	911.02	13227.02
5	Watch and ward (12 months - 1 watcher per 10 ha)	36.50	16187.75	0.00	16187.75
6	Fire tracing	2.00	887.00	0.00	887.00
	Total	**73.48**	**32588.38**	**1719.06**	**34307.44**
	Contingency 3%				**1029.22**
	Labour Welfare 4%				**1372.30**
	Grand Total				**36708.96**
D	**Third Year Operations**				
1	1 weeding and 1 soil workings (1.50 M.D. per 100 seedlings) fertilizer application of Rs. 0.82 per plant	16.67	7393.15	911.02	8304.17
2	Watch and ward (12 months - 1 watcher per 10 ha)	36.50	16187.75	0.00	16187.75
3	Counting of survival percentage Grid wise and Species wise and to Note the same on Register in May and October	2.00	887.00	25.00	912.00

S. No.	Particulars of Works	Man Day	Wages	Material Supply	Total
4	Fire tracing	2.00	887.00	0.00	887.00
	Total	**57.17**	**25354.90**	**936.02**	**26290.92**
	Contingency 3%				**788.73**
	Labour Welfare 4%				**1051.64**
	Grand Total				**28131.28**
E	**Fourth Year Operations**				
1	Watch and ward (12 months - 1 watcher per 10 ha)	36.50	16187.75	0.00	16187.75
2	Counting of survival percentage Grid wise and Species wise and to Note the same on Register in May and October	2.00	887.00	25.00	912.00
3	Fire tracing	2.00	887.00	0.00	887.00
	Total	**40.50**	**17961.75**	**25.00**	**17986.75**
	Contingency 3%				**539.60**
	Labour Welfare 4%				**719.47**
	Grand Total				**19245.82**

Abstract

S. No.	Year of Operation	Man days	Wages	Material Supply	Total	Other Expenses	Total Amount	Or Say
1	Pre Monsoon Works	167.97	74494.70	193263.83	**267758.53**	18743.10	**286501.62**	**286500.00**
2	First Year Operation	132.25	58652.88	7164.64	**65817.52**	4607.23	**70424.74**	**70420.00**
3	Second Year Operation	73.48	32588.38	1719.06	**34307.44**	2401.52	**36708.96**	**36710.00**
4	Third Year Operation	57.17	25354.90	936.02	**26290.92**	1840.36	**28131.28**	**28130.00**
5	Fourth Year Operation	40.50	17961.75	25.00	**17986.75**	1259.07	**19245.82**	**19240.00**
	Total	**471.37**	**209052.60**	**203108.55**	**412161.15**	**28851.28**	**441012.43**	**441000.00**

3. Per Hectare Model Rate Structure for Aided Natural Regeneration

Spacement: 4m x 4m **Wage Rate: Rs. 443.50 per day**

No. of Seedlings: 625

S. No.	Particulars of Works	Man Day	Wages	Material Supply	Total
A	**Pre Monsoon Works PPO/ PYO**				
1	(a) Survey and demarcation	1.00	443.50	50.00	493.50
	(b) Preparation of treatment map (100 m x 50 m grid)	1.00	443.50	50.00	493.50
	(c) Clearing of bushes and preparation of site (As per requirement)	10.00	4435.00	50.00	4485.00
2	Soil and moisture conservation works including collection of rubbles from areas upto 30m etc.	31.00	13748.50	0.00	13748.50
3					
4	Alignment of pits at 5m x 5m spacement. 625 pits per ha (0.13 per 50 pits and M&S @ Rs. 2.24 per 50 pits)	1.62	718.47	28.00	746.47

S. No.	Particulars of Works	Man Day	Wages	Material Supply	Total
5	Digging of pits of size 0.60x0.60x0.60 (625 pits per ha) 36.26 M.D. per 100 pits.	207.88	92194.78	0.00	92194.78
	Total	**252.50**	**111983.75**	**178.00**	**112161.75**
	Contingency 3%				**3364.85**
	Labour Welfare 4%				**4486.47**
	Grand Total				**120013.07**
B	**First Year Operations**				
1	Purchases of selected seedling 687 seedlings per ha (50% Bearing species) Rs. 50 per seedling	0.00	0.00	34350.00	34350.00
2	Refilling of pits by good quality soil including application of single super phosphate (2.5 MD per 50 pits)	31.25	13859.38	21600.00	35459.38
3	Transportation of seedling from Nursery to plantation site (including loading & unloading) Wages 1.00 MD per 55 seedlings and M.S. Rs. 300 per 55 seedlings	12.49	5539.32	3747.00	9286.32
4	Planting of 625 seedlings (2.01 M.D. per 50 seedling)	25.13	11145.16	0.00	11145.16
5	Planting for 10% casualty replacement	1.26	558.81	0.00	
5	3 weeding and 2 soil workings (3.40 M.D. per 50 seedlings)	42.50	18848.75	281.00	19129.75
6	Watch and ward (10 months - 1 watcher per 10 ha)	30.00	13305.00	0.00	13305.00
7	Fire tracing	2.00	887.00	0.00	887.00
8	Purchases of selected seedling 687 seedlings per ha (50% Bearing species) Rs. 50 per seedling	0.00	0.00	34350.00	34350.00
	Total	**144.63**	**64143.41**	**59978.00**	**124121.41**
	Contingency 3%				**3723.64**
	Labour Welfare 4%				**4964.86**
	Grand Total				**132809.90**
C	**Second Year Operations**				
1	3 weeding and soil workings (3.40 M.D. per 50 plants) fertilizer application Rs. 0.45 per plant	42.50	18848.75	281.00	19129.75
2	Watch and ward (12 months - 1 watcher per 10 ha)	36.50	16187.75	0.00	16187.75
3	Fire tracing	2.00	887.00	0.00	887.00
	Total	**81.00**	**35923.50**	**281.00**	**36204.50**
	Contingency 3%				**1086.14**
	Labour Welfare 4%				**1448.18**
	Grand Total				**38738.82**
D	**Third Year Operations**				
1	3 weeding and soil workings (3.40 M.D. per 50 plants) fertilizer application Rs. 0.45 per plant	42.50	18848.75	281.00	19129.75
2	Watch and ward (12 months - 1 watcher per 10 ha)	36.50	16187.75	0.00	16187.75
3	Fire tracing	2.00	887.00	0.00	887.00
	Total	**81.00**	**35923.50**	**281.00**	**36204.50**
	Contingency 3%				**1086.14**
	Labour Welfare 4%				**1448.18**
	Grand Total				**38738.82**
E	**Fourth Year Operations**				
1	Watch and ward (12 months - 1 watcher per 10 ha)	36.50	16187.75	0.00	16187.75
2	Fire tracing	2.00	887.00	0.00	887.00
	Total	**38.50**	**17074.75**	**0.00**	**17074.75**
	Contingency 3%				**512.24**

S. No.	Particulars of Works	Man Day	Wages	Material Supply	Total
	Labour Welfare 4%				**682.99**
	Grand Total				**18269.98**
F	**Fifth Year Operations**				
1	Watch and ward (12 months - 1 watcher per 10 ha)	36.50	16187.75	0.00	16187.75
2	Fire tracing	2.00	887.00	0.00	887.00
	Total	**38.50**	**17074.75**	**0.00**	**17074.75**
	Contingency 3%				**512.24**
	Labour Welfare 4%				**682.99**
	Grand Total				**18269.98**

Abstract

S. No.	Year of Operation	Mandays	Wages	Material Supply	Total	Other Expenses	Total Amount	Or Say
1	Pre Monsoon Works	252.50	111983.75	178.00	**112161.75**	7851.32	**120013.07**	120010
2	First Year Operation	144.63	64143.41	59978.00	**124121.41**	8688.50	**132809.90**	132810
3	Second Year Operation	81.00	35923.50	281.00	**36204.50**	2534.32	**38738.82**	38740
4	Third Year Operation	81.00	35923.50	281.00	**36204.50**	2534.32	**38738.82**	38740
5	Fourth Year Operation	38.50	17074.75	0.00	**17074.75**	1195.23	**18269.98**	18270
6	Fifth Year Operation	38.50	17074.75	0.00	**17074.75**	1195.23	**18269.98**	18270
	Total	**636.13**	**282123.66**	**60718.00**	**342841.66**	**23998.92**	**366840.57**	**366840**

4. Per Hectare Model Rate Structure for Continuous Contour Trench (CCT)

S. No.	Particular Works	Man days	Wages (Rs)	Material Supply	Total Cost/Ha.
1	Survey & Demarcation of area & Preparation of treatment map (M&S @Rs. 6 per Ha)	1.00	443.50	300.00	743.50
2	Gully plugging work maximum up to 10 Cu. M (0.87-man-days per Cu. M).	8.69	3854.02	0.00	3854.02
3	For CCT & their spacing 0.25 mandays per 100Rmt. Per ha. 1600Rmt.	4.17	1849.40	333.00	2182.40
4	By digging and excavating 0.6m to 0.3m deep CCT construct 0.3 m high embankment on the slope side of the pasture from excavated soil per ha. 1514 Rmt. as 270 Cu. M.	169.63	75230.91	0.00	75230.91
5	Agave plantations along with transportation near the base of drains and CCTs per 100 circuses as Rs.25/- for planting 100 circuses as Rs.0.40/- man-days 1700 circus/ha.	6.80	3015.80	0.00	3015.80
6	For top of embankment beside CCT for 100 m. length Sow 1 kg of seeds as follows 1) Seed rate Rs.25 per kg 2) For sowing seeds in 100 Rmt. Rs.0.025 man-days in 15.14 kg/ha	0.38	168.53	1550.81	1719.34
	Total	**190.67**	**84562.15**	**2183.81**	**86745.96**
	Add 3% Contingency				2602.38
	Add 4% Labour welfare				3469.84
	Grant Total				**92818.17**
	Or Say				**92820.00**

सत्यमेव जयते

Government of India

Ministry of Environment, Forest and Climate Change

(Forest Conservation Division)

Online Proposal No.:
FP/MH/HYD/IRRIG/447097/2023

Dated: **12/05/2025**

To,

The Principal Secretary (Forests),
Government of Maharashtra,
Mumbai.

Subject: **Proposal for seeking prior approval of the Central Government under Section 2(1) (ii) of the Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980 for diversion of 20.15 ha forest land for the development of Bhivpuri off-stream open loop pumped storage project (1000 MW) in favour of M/s Tata Power Company Limited in Pune and Raigad District of Maharashtra State (Online No. FP/MH/HYD/IRRIG/447097/2023) - regarding.**

Sir/Madam,

I am directed to refer the Government of Maharashtra's communication dated 28.10.2024 on the above subject seeking prior approval of the Central Government under section 2 (1) (ii) of the Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980 and to say that the proposal has been examined by the Advisory Committee constituted by the Central Government under Section-3 of the aforesaid Act.

2. After careful examination of the proposal of the State Government and on the basis of the recommendations of the Advisory Committee and with due approval of the competent authority, the Central Government hereby accords **'in-principle'** approval under Section 2 (1) (ii) of the Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980 for diversion of 20.15 ha forest land for the development of Bhivpuri off-stream open loop pumped storage project (1000 MW) in favour of M/s Tata Power Company Limited in Pune and Raigad District in the State of Maharashtra subject to fulfilment of the following conditions:

1. General Conditions

S. No	Conditions
1.1	Legal status of the diverted forest land shall remain unchanged

S. No	Conditions
1.2	The Compensatory afforestation over an area of 20.15 ha Non -Forest land shall be raised at the project cost under the supervision of the State Forest Department and afforestation works shall start within two years from the date of Final approval and maintained thereafter in accordance with the approved CA scheme in consultation with the State Forest Department;
1.3	The User Agency shall transfer the cost of raising and maintaining the compensatory afforestation as per the approved CA scheme at the current wage rate in consultation with State Forest Department in the account of CAMPA of the concerned State through online portal;
1.4	The cost of survey, demarcation and erection of permanent pillars, if required on the identified CA land, shall be deposited in advance with the Forest Department by the user agency. The CA will be maintained for 10 years. The scheme may include afforestation of indigenous species with appropriate provision for anticipated cost increase for works scheduled for subsequent years
1.5	The non-forest land shall be transferred and mutated in favour of the State Forest Department and further the same shall be notified by the State Government as PF under Section-29 of the Indian Forest Act, 1927 or under the relevant Section(s) of the local Forest Act, 1927 before handing over the forest land to the User Agency.
1.6	The User Agency shall transfer the funds towards the cost of Net Present Value (NPV) of the forest land being diverted under this proposal in accordance with the MoEF&CC's guidelines dated 6.01.2022 read with guidelines dated 19.01.2022;
1.7	At the time of payment of the Net Present Value (NPV) at the present rate, the user agency shall furnish an undertaking to pay the additional amount of NPV, if so determined, as per the final decision of the Hon'ble Supreme Court of India;
1.8	The State Government shall upload the KML files of the area under diversion and the accepted area for raising compensatory afforestation in the e-Green watch portal of FSI, before handling over forest land to the user agency;
1.9	All the funds received from the user agency under the project shall be transferred/deposited in CAMPA account only through e-portal (https://parivesh.nic.in/); Amount deposited through other mode will not be accepted as compliance of the in-principle approval;
1.10	The cost of felling of trees shall be deposited by the User Agency with the State Forest Department;
1.11	Felling of trees shall be done in phase-wise manner, when it is absolutely necessary under strict supervision of the State Forest Department;
1.12	The user agency shall explore the possibility of translocation of maximum number of trees identified to be felled and shall ensure that any tree felling shall be done only when it is unavoidable and that too under strict supervision of the State Forest Department;

S. No	Conditions
1.13	The User Agency shall obtain the Environment Clearance as per the provisions of the Environmental (Protection) Act, 1986, if required;
1.14	No labour camp shall be established on the forest land and the User Agency shall provide fuels preferably alternate fuels to the labourers and the staff working at the site so as to avoid any damage and pressure on the nearby forest areas;
1.15	The boundary of the diverted forest land, as applicable, shall be demarcated on ground at the project cost, by erecting four feet high reinforced cement concrete pillars, each inscribed with its serial number, distance from pillar to pillar and GPS coordinates;
1.16	The layout plan of the proposal shall not be changed without the prior approval of the Central Government and the forest land shall not be used for any purpose other than that specified in the proposal except the change in land use allowed on the forest land vide Ministry's guideline dated 26.12.2024;
1.17	The forest land proposed to be diverted shall under no circumstances be transferred to any other agency, department or person without prior approval of the Central Government;
1.18	No damage to the flora and fauna of the adjoining area shall be caused;
1.19	The user agency shall comply all the provisions of the all Acts, Rules, Regulations, Guidelines, Hon'ble Court Order (s) and NGT Order (s) pertaining to this project, if any, for the time being in force, as applicable to the project;
1.20	The User Agency shall submit the annual self -compliance report in respect of the above stated conditions to the State Government, concerned Regional Office and to this Ministry by the end of March every year regularly;
1.21	Any other condition that the Ministry of Environment, Forests & Climate Change may stipulate from time to time in the interest of conservation, protection and development of forests & wildlife shall be carried with by the State Government and user agency;
1.22	Violation of any of these conditions will amount to violation of Forest (Conservation) Act, 1980 and action would be taken as prescribed in para 1.16 of Chapter 1 of the Handbook of comprehensive guidelines of Forest (Conservation) Act, 1980 as issued by this Ministry's letter No. 5-2/2017-FC dated 29.12.2023;
1.23	The compliance report shall be uploaded on e-portal (https://parivesh.nic.in/).

2. Standard conditions

S. No	Conditions
2.1	The user agency shall undertake afforestation along the periphery of the reservoir and canals (as applicable).
2.2	The user agency shall carry out muck disposal at pre-designated sites in such a manner so as to avoid its rolling down. A muck disposal plan may be submitted along with the compliance report.
2.3	The dumping area for muck disposal shall be stabilized and reclaimed by planting suitable species by the user agency at the cost of project under the supervision of State Forest Department. Retaining walls and terracing shall be carried out to hold the dumping material in place. Stabilization and reclamation of such dumping sites shall be completed before handing over the same to the State Forest Department in a time bound manner as per Plan. A copy of plan may be submitted along with the compliance report.
2.4	The User agency shall consult organization(s) having experience in construction of roads in hilly areas to avoid frequent road blockade due to landslides etc and shall provide breast walls and retaining walls wherever necessary.

3. Specific Conditions

S. No	Conditions
3.1	As the project is to be implemented in a very steep area, appropriate Soil and Moisture Conservation measures shall be taken by the user agency during the execution of the work.
3.2	The Catchment Area Treatment plan submitted by the State shall be implemented at the cost of the user agency.
3.3	The State Govt. should make all due diligence for formulating the improvement plan for the CA area. The plan should include components/activities which help in improving soil and moisture regime and the biodiversity of the area and make a visible positive impact in due course of time.

After receipt of compliance report on fulfillment of the conditions mentioned above, the proposal shall be considered for final approval under Section-2 (1) (ii) of the Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980. Transfer of forest land shall not be affected till final approval is granted by the Central Government in this regard.

Copy To

1. The PCCF (HoFF), Department of Forest, Government of Maharashtra, Nagpur;
2. The Dy. DGF (Central), Regional Office, MoEF&CC, Nagpur;
3. The Nodal Officer, Department of Forest, Government of Maharashtra, Nagpur;
4. User Agency;
5. Monitoring Cell, FC Division, MoEF&CC, New Delhi.

Your's faithfully

(Suneet Bhardwaj)
Assistant Inspector General of Forests

Annexure 6 - Approval for Biodiversity and Wildlife conservation plan from PCCF

वन विभाग

प्रधान मुख्य वनसंरक्षक (वनबल प्रमुख) महाराष्ट्र राज्य, यांचे कार्यालय

O/o Principal Chief Conservator of Forests (HoFF), Maharashtra State

Phone No.- 0712-2560953
E-mail - pccfwlngp@mahaforest.gov.in
Website – www.mahaforest.gov.in

मुख्य प्रधान वनसंरक्षक (वन्यजीव) महाराष्ट्र राज्य,
Principal Chief Conservator of Forest (Wildlife) Maharashtra State.
"Van Bhavan", 3rd Floor, Ramgiri Road, Civil Lines, Nagpur – 440 001.

पत्र-ई मेल क्रमांक :-कक्ष-२३(२)/वजी/सर्व/प्र.क्र.६२/ १११८३/२०२४-२५ दिनांक ०९/०७/२०२४

प्रति,

Shri. Abhijeet Patil, Head-special Projects,
The Tata Power Company Limited,
Old Pune-Mumbai road, NH-4, Dist. Pune,
Maharashtra. E-mail- tatapower@tatapower.com

विषय :- Conservation Plan for Schedule-I species in project area of Bhivpuri Off-Stream open Loop Pumped Storage Project (1000MW) of M/s The Tata Power co.ltd. located near village Vadeshwar and Bhivpuri, Tehsil Karjat and Mawal, Dist. Raigarh and Pune, Maharashtra by submitted-Approval there of.

संदर्भ :- १. पर्यावरण, वने व जलवायु परिवर्तन मंत्रालय, भारत सरकार, आय ए विभाग, नवी दिल्ली यांचेकडील पत्र क्र. J-१२०११/३९/२०२३-IA.I(R), दिनांक २३/०९/२०२३.
२. आपलेकडील पत्र क्र. LNL/HWS/२०२४/१४४, दिनांक २२/०४/२०२४.

प्रस्तुत विषयांकित प्रकरणी संदर्भ पत्र-१ अन्वये केंद्र शासनाने Environment Impact Assessment अधिसूचना, २००६ च्या तरतुदीनूसार विषयांकित प्रस्तावास घालून दिलेल्या अटींचे अधीन राहून तत्वत: मान्यता प्रदान केलेली आहे.

सदरहू प्रस्तावाचे अनुषंगाने अट क्रमांक ४ Environmental Management and Biodiversity Conservation मधील अनु क्र. १३ व १४ खालीलप्रमाणे अनुक्रमे घालून दिलेल्या आहेत.

4.1.13 ***"A detailed wildlife conservation plan for schedule-I species,duly approved by the Chief wildlife warden, be submitted."***

4.1.14 ***"In case any Wildlife Corridor is located with in 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."***

वरील अट क्र. ४ मधील अनु क्र. १३ चे अनुषंगाने, उपरोक्त संदर्भिय पत्र-२ अन्वये वन्यजीव संवर्धन आराखडा या कार्यालयाचे मान्यतेसाठी सादर केलेला आहे. सदरील वन्यजीव संवर्धन आराखड्यातील ठळक बाबी पुढीलप्रमाणे आहे.

प्रकल्प यंत्रणेने १० वर्षाकरीता एकुण रू. २१०.०० लक्ष आर्थिक तरतुद आराखड्यामध्ये केलेली आहे. बाबनिहाय तपशिल खालीलप्रमाणे आहे.

Total Cost of Biodiversity Management and Wildlife Conservation Plan

Sr. No.	Conservation Activities	Amount (in rs. Lakhs)
1.	Habitat Improvement by development of vegetation cover by plantation with suitable species.	24.00
2.	Biological fence to control human wildlife conflict	20.00
3.	Farm Forestry	10.00
4.	Maintenance of existing nurseries of state forest department	10.00
5.	Development and Management of Grasslands	20.00
6.	Removal of Invasive species	5.00
7.	Awareness for shifting cultivation and conservation of Natural resources	8.00
8	Prevention of Forest Fire: Training and Infrastructure facilities	18.00
9.	Construction and filling of water holes and ponds in wildlife habitat.	15.00
10.	Support/ Provision for monkey sterilization and veterinary care, cages, recuse centers, etc.	30.00
11.	Training and capacity building for volunteers and officials of forest department	15.00
12.	Strengthening of Infrastructural facilities of forest department	25.00
13.	Contingencies	10.00
	Total cost	210.00

तरी, केन्द्र शासनाने घालून दिलेल्या अटीचे अनुषंगाने वरील रू. २१०.०० लक्ष रक्कम असलेला **वन्यजीव संवर्धन आराखडा वन्यजीव व्यवस्थापनाच्या दृष्टीने पोषक स्वरूपाचा असल्यामूळे, त्यांस मान्यता प्रदान करण्यात येत आहे.**

तसेच वरील अट क्र. ४ मधील अनु क्र. १४ नूसार प्रकल्प क्षेत्रापासून १० कि.मी. चे परिसरात कोणतेही अभयारण्य, राष्ट्रीय उद्यान किंवा व्याघ्र भ्रमणमार्ग असल्याचे आढळून येत नाही. प्रकल्प क्षेत्रापासून सर्वात जवळचे संरक्षीत क्षेत्र हे भिमाशंकर वन्यजीव अभयारण्य आहे. प्रस्तावित प्रकल्प क्षेत्रापासून भिमाशंकर वन्यजीव अभयारण्याचे हवाई अंतर १०.३७ कि.मी. इतके दूर आहे. त्यामूळे सदर प्रस्तावास वन्यजीव मान्यता घेण्याची आवश्यकता नाही.

केंद्र शासनाने प्रकल्प यंत्रणेस घालून दिलेल्या अटीचे अनुषंगाने, संदर्भिय पत्र-२ अन्वये प्राप्त झालेला नकाशा मुख्य वन्यजीव रक्षक, म.रा. यांनी सांक्षाकन करून यासोबत सहपत्रीत करण्यात येत आहे.

सहपत्र : वरीलप्रमाणे.

(महिपाल गुप्ता)
प्रधान मुख्य वनसंरक्षक (वन्यजीव),
महाराष्ट्र राज्य

प्रतिलिपी : अपर प्रधान मुख्य वनसंरक्षक (वन्यजीव) पश्चिम, मुंबई यांना माहितीस व आवश्यक कार्यवाहीस अग्रेषित.

MAHARASHTRA POLLUTION CONTROL BOARD

Tel: 24010706/24010437
Fax: 24023516
Website: http://mpcb.gov.in
Email: cac-cell@mpcb.gov.in

Kalpataru Point, 2nd, 3rd and 4th floor, Opp. Cine Planet Cinema, Near Sion Circle, Sion (E), Mumbai-400022

RED/L.S.I (R9)
No:- Format1.0/CAC/UAN No.0000223630/CE/2501001061

Date: 13/01/2025

To,
M/s.The Tata Power Company Limited, Bhivpuri Off -Stream Open Loop Pumped Storage Hydro Project, 1,Bhivpuri Camp,Tal-Karjat,Dist. -Raigad

LiFE Lifestyle for Environment

Your Service is Our Duty

Sub: Consent to Establish

Ref:
1. Your application for consent to establish vide UAN No. MPCB-CONSENT-0000223630
2. 14th Consent Appraisal Committee held on dtd. 07/01/2025.

Your application No.MPCB-CONSENT-0000223630 Dated 15.10.2024

For: Grant of Consent to Establish under Section 25 of the Water (Prevention & Control of Pollution) Act, 1974 & under Section 21 of the Air (Prevention & Control of Pollution) Act, 1981 and Authorization under Rule 6 and Rule 18(7) of the Hazardous & Other Wastes (Management & Transboundary Movement) Rules 2016 is considered and the consent is hereby granted subject to the following terms and conditions and as detailed in the schedule I, II, III & IV annexed to this order:

1. **The consent to establish is granted for a period up to commissioning of the unit or up to 5 year whichever is earlier.**
2. **The capital investment of the project is Rs.4743.59 Crs. (As per undertaking submitted by pp)**
3. **Consent is valid for the manufacture of:**

Sr No	Product	Maximum Quantity	UOM
Products			
1	PP has applied for consent to establish for below mentioned activity. 1 Pump Storage Power Generation (PSP) - 4 X 200 MW + 2 X 100 MW Major civil structures consist of as below a) Upper Reservoir (Existing Structure) b) Upper Intake c) Hear Race Tunnel d) Pressure Shaft/buried Penstock (Right Limb) e) Pressure Shaft/buried Penstock (Left Limb) f) Pit Type Powerhouse & Transformer Bay g) Tailrace Tunnel h) Lower Reservoir and Dam (Geo Membrane Facing Rock Fill Dam - GFRD)	1000	MW

4. **Conditions under Water (P&CP), 1974 Act for discharge of effluent:**

Sr No	Description	Permitted (in CMD)	Standards to	Disposal Path
1.	Trade effluent	0.0	As per Schedule-I	Not Applicable
2.	Domestic effluent	19	As per Schedule-I	On land for gardening

5. **Conditions under Air (P& CP) Act, 1981 for air emissions:**

Sr No.	Stack No.	Description of stack / source	Number of Stack	Standards to be achieved
1	S1	DG Set 1250 KVA	1	As per Schedule -II

6. **Non-Hazardous Wastes:**

Sr No	Type of Waste	Quantity	UoM	Treatment	Disposal
NA					

7. **Conditions under Hazardous & Other Wastes (M & T M) Rules 2016 for Collection, Segregation, Storage, Transportation, Treatment and Disposal of hazardous waste:**

Sr No	Category No./ Type	Quantity	UoM	Treatment	Disposal
1	5.1 Used or spent oil	50	MT/A	Recycle	Disposal to MPCB approved recycler
2	Other	5	MT/A	Disposal to MPCB approved recycler	Disposal to MPCB approved recycler
3	Other	5	MT/A	Disposal to MPCB approved recycler	Disposal to MPCB approved recycler

8. The Board reserves the right to review, amend, suspend, revoke this consent and the same shall be binding on the industry.
9. This consent should not be construed as exemption from obtaining necessary NOC/ permission from any other Government authorities.
10. The applicant shall obtaining Environmental Clearance.
11. The industry shall obtain necessary permission from the Directorate of Industrial Safety and Health (DISH).
12. The industry shall strictly follow Board Circular for Retro-Fitting of Emission Control Device (RECD) for in-use D.G. Sets vide no. MPCB/JD(APC)/NCAP/DG Set/B-0090 dtd. 02/06/2023.
13. This consent is issued pursuant to the minutes of 14th Consent Appraisal Committee held dtd. 07/01/2025.
14. The applicant shall obtain Consent to Operate from Maharashtra Pollution Control Board before actual commencement of the Unit/Activity.

15. The industry shall create an Environment Cell by appointing an Environmental Engineer / Expert for looking after day-to-day activities related to Environment / Pollution control.

This consent is issued on the basis of information/documents submitted by the Applicant/Project Proponent, if it has been observed that the information submitted by the Applicant/Project Proponent is false, misleading or fraudulent, the Board reserves its right to revoke the consent & further legal action will be initiated against the Applicant/Project Proponent.

Received Consent fee of -

Sr.No	Amount(Rs.)	Transaction/DR.No.	Date	Transaction Type
1	9487180.00	MPCB-DR-30042	06/11/2024	NEFT

Copy to:

1. Regional Officer, MPCB, Raigad and Sub-Regional Officer, MPCB, Raigad II
- They are directed to ensure the compliance of the consent conditions.
2. Chief Accounts Officer, MPCB,Sion, Mumbai

SCHEDULE-I

Terms & conditions for compliance of Water Pollution Control:

1. A] Generation - As per your application the treated effluent generation is Nil.
   B] Treatment - NA
   C] Disposal - NA

2. A] As per your application, you have provided Sewage Treatment Plant of designed capacity 25.0CMD for the treatment of 19.0 CMD of sewage.

   B] The Applicant shall operate the sewage treatment system to treat the sewage so as to achieve the following standards.

Sr.No	Parameters	Standards (mg/l)	
1	Suspended Solids	Not to exceed	50
2	BOD 3 days 27°C	Not to exceed	30
3	COD	Not to exceed	100

   C] The treated sewage shall be recycled for secondary purposes to the maximum extent and remaining shall be discharged on land for gardening within premise after confirming above standards. In no case, sewage shall find its way for gardening / outside factory premises.

3. The Board reserves its rights to review plans, specifications or other data relating to plant setup for the treatment of waterworks for the purification there of & the system for the disposal of sewage or trade effluent or in connection with the grant of any consent conditions. The Applicant shall obtain prior consent of the Board to take steps to establish the unit or establish any treatment and disposal system or an extension or addition thereto.
4. The industry shall ensure replacement of pollution control system or its parts after expiry of its expected life as defined by manufacturer so as to ensure the compliance of standards and safety of the operation thereof.
5. The Applicant shall comply with the provisions of the Water (Prevention & Control of Pollution) Act, 1974 and as amended, by installing water meters and other provisions as contained in the said act:

Sr. No.	Purpose for water consumed	Water consumption quantity (CMD)
1.	Industrial Cooling, spraying in mine pits or boiler feed	0.00
2.	Domestic purpose	21.00
3.	Processing whereby water gets polluted & pollutants are easily biodegradable	0.00
4.	Processing whereby water gets polluted & pollutants are not easily biodegradable and are toxic	0.00
5.	Gardening	0.00

6. The Applicant shall provide Specific Water Pollution control system as per the conditions of EP Act, 1986 and rule made there under from time to time/ Environmental Clearance/ CREP guidelines.

SCHEDULE-II

Terms & conditions for compliance of Air Pollution Control:

1. As per your application, you have proposed to provide the Air pollution control (APC) system and also to erect following stack (s) to observe the following fuel pattern:

Stack No.	Source	APC System provided/proposed	Stack Height(in mtr)	Type of Fuel	Sulphur Content(in %)	Pollutant	Standard
S1	DG Set 1250 KVA	Acoustic Enclosure Stack	30.00	HSD 260 Ltr/Hr	1	TPM	50 Mg/Nm^3

2. The Applicant shall provide Specific Air Pollution control equipments as per the conditions of EP Act, 1986 and rule made there under from time to time/ Environmental Clearance / CREP guidelines.
3. The applicant shall operate and maintain above mentioned air pollution control system, so as to achieve the level of pollutants to the following standards:

Parameters	Standards
Standards for DG Sets	
NOx (as NO_2) (AT 15% O_2), dry basis, in ppmv More then 150 MW	360
NMHC (as C)(at 15% O_2), mg/Nm^3	100
PM (at 15% O_2), mg/Nm^3 Diesel Fuels- HSD & LDO	75
PM (at 15% O_2), mg/Nm^3 Furnance Oils- LSHS & FO	100
CO (at 15% O_2), ng/NM3	150

4. The Applicant shall obtain necessary prior permission for providing additional control equipment with necessary specifications and operation thereof or alteration or replacement/alteration well before its life come to an end or erection of new pollution control equipment.
5. The Board reserves its rights to vary all or any of the condition in the consent, if due to any technological improvement or otherwise such variation (including the change of any control equipment, other in whole or in part is necessary).

SCHEDULE-III

Details of Bank Guarantees:

Sr. No.	Consent (C2E/ C2O /C2R)	Amt of BG Imposed	Submission Period	Purpose of BG	Compliance Period	Validity Date
NA						

If the above Bank Guarantee is not submitted within stipulated period, then 12% interest will be levied as a penalty as per circular dtd 29/02/2024 No. BO/MPCB/AS(T)/Circular/B-240229FTS0122

BG Forfeiture History

Srno.	Consent (C2E/C2O/C2R)	Amount of BG imposed	Submission Period	Purpose of BG	Amount of BG Forfeiture	Reason of BG Forfeiture
NA						

BG Return details

Srno.	Consent (C2E/C2O/C2R)	BG imposed	Purpose of BG	Amount of BG Returned
NA				

SCHEDULE-IV

General Conditions:

1. The Energy source for lighting purpose shall preferably be LED based
2. The PP shall harvest rainwater from roof tops of the buildings and storm water drains to recharge the ground water and utilize the same for different industrial applications within the plant
3. Conditions for D.G. Set
   a) Noise from the D.G. Set should be controlled by providing an acoustic enclosure or by treating the room acoustically.
   b) Industry should provide acoustic enclosure for control of noise. The acoustic enclosure/ acoustic treatment of the room should be designed for minimum 25 dB (A) insertion loss or for meeting the ambient noise standards, whichever is on higher side. A suitable exhaust muffler with insertion loss of 25 dB (A) shall also be provided. The measurement of insertion loss will be done at different points at 0.5 meters from acoustic enclosure/room and then average.
   c) Industry should make efforts to bring down noise level due to DG set, outside industrial premises, within ambient noise requirements by proper sitting and control measures.
   d) Installation of DG Set must be strictly in compliance with recommendations of DG Set manufacturer.
   e) A proper routine and preventive maintenance procedure for DG set should be set and followed in consultation with the DG manufacturer which would help to prevent noise levels of DG set from deteriorating with use.
   f) D.G. Set shall be operated only in case of power failure.
   g) The applicant should not cause any nuisance in the surrounding area due to operation of D.G. Set.
   h) The applicant shall comply with the notification of MoEFCC, India on Environment (Protection) second Amendment Rules vide GSR 371(E) dated 17.05.2002 and its amendments regarding noise limit for generator sets run with diesel.
4. The applicant shall maintain good housekeeping.
5. The non-hazardous solid waste arising in the factory premises, sweepings, etc. be disposed of scientifically so as not to cause any nuisance / pollution. The applicant shall take necessary permissions from civic authorities for disposal of solid waste.
6. The applicant shall not change or alter the quantity, quality, the rate of discharge, temperature or the mode of the effluent/emissions or hazardous wastes or control equipments provided for without previous written permission of the Board. The industry will not carry out any activity, for which this consent has not been granted/without prior consent of the Board.
7. The Board reserves the right to review, amend, suspend, revoke this consent and the same shall be binding upon you.
8. The industry shall submit quarterly statement in respect of industries obligation towards consent and pollution control compliance's duly supported with documentary evidences (format can downloaded from MPCB official site).
9. The industry shall submit official e-mail address and any change will be duly informed to the MPCB.
10. The industry shall achieve the National Ambient Air Quality standards prescribed vide Government of India, Notification No. B-29016/20/90/PCI-L dated. 18.11.2009 as amended.
11. This consent should not be construed as exemption from obtaining necessary NOC/ permission from any other Government authorities.

12. The industry shall ensure replacement of pollution control system or its parts after expiry of its expected life as defined by manufacturer so as to ensure the compliance of standards and safety of the operation thereof.
13. You shall operate OCEMS installed for source emission round 'O' clock and transmit data online to CPCB and MPCB server. You shall also monitor effluent quality, stack emissions and ambient air quality monthly/quarterly. You shall conduct Dioxin Furan monitoring by third party NABL Accredited agency once in year and submit report to Sub Regional Officer.
14. You shall ensure collection, and segregation of BMW regularly to treat and dispose Off within 48 hrs from generation.
15. Whenever due to any accident or other unforeseen act or even, such emissions occur or is apprehended to occur in excess of standards laid down, such information shall be forthwith Reported to Board, concerned Police Station, office of Directorate of Health Services, Department of Explosives, Inspectorate of Factories and Local Body. In case of failure of pollution control equipments, the production process connected to it shall be stopped.
16. The applicant shall provide an alternate electric power source sufficient to operate all pollution control facilities installed to maintain compliance with the terms and conditions of the consent. In the absence, the applicant shall stop, reduce or otherwise, control production to abide by terms and conditions of this consent.
17. The industry shall recycle/reprocess/reuse/recover Hazardous Waste as per the provision contain in the Hazardous and Other Wastes (M & TM) Rules 2016, which can be recycled /processed /reused /recovered and only waste which has to be incinerated shall go to incineration and waste which can be used for land filling and cannot be recycled/reprocessed etc. should go for that purpose, in order to reduce load on incineration and landfill site/environment.
18. An inspection book shall be opened and made available to the Board’s officers during their visit to the applicant.
19. You shall not Rent, Lend, Sell, Transfer or Close Down the facility or otherwise transport the Bio Medical waste for any other purpose without obtaining prior written permission of the MPC Board.
20. Separate drainage system shall be provided for collection of trade and sewage effluents. Terminal manholes shall be provided at the end of the collection system with arrangement for measuring the flow. No effluent shall be admitted in the pipes/sewers downstream of the terminal manholes. No effluent shall find its way other than in designed and provided collection system.
21. Neither storm water nor discharge from other premises shall be allowed to mix with the effluents from the factory.
22. The industry should not cause any nuisance in surrounding area.
23. The industry shall take adequate measures for control of noise levels from its own sources within the premises so as to maintain ambient air quality standard in respect of noise to less than 75 dB (A) during day time and 70 dB (A) during night time. Day time is reckoned in between 6 a.m. and 10 p.m. and night time is reckoned between 10 p.m. and 6 a.m.
24. You shall ensure that fugitive emissions from the activity are controlled so as to maintain clean and safe environment in and around the facility premises.

25. The applicant shall provide ports in the chimney/(s) and facilities such as ladder, platform etc. for monitoring the air emissions and the same shall be open for inspection to/and for use of the Board's Staff. The chimney(s) vents attached to various sources of emission shall be designated by numbers such as S-1, S-2, etc. and these shall be painted/ displayed to facilitate identification.
26. The Board reserves its rights to review plans, specifications or other data relating to plant setup for the treatment of waterworks for the purification thereof & the system for the disposal of sewage or trade effluent or in connection with the grant of any consent conditions. The Applicant shall obtain prior consent of the Board to take steps to establish the unit or establish any treatment and disposal system or an extension or addition thereto
27. The applicant shall install a separate meter showing the consumption of energy for operation of domestic and industrial effluent treatment plants and air pollution control system. A register showing consumption of chemicals used for treatment shall be maintained.
28. The applicant shall bring minimum 33% of the available open land under green coverage/ plantation. The applicant shall submit a yearly statement by 30th September every year on available open plot area, number of trees surviving as on 31st March of the year and number of trees planted by September end.
29. The Board reserves its rights to review plans, specifications or other data relating to plant setup for the treatment of waterworks for the purification thereof & the system for the disposal of sewage or trade effluent or in connection with the grant of any consent conditions.
30. The firm shall submit to this office, the 30th day of September every year, the Environment Statement Report for the financial year ending 31st March in the prescribed FORM-V as per the provisions of Rule 14 of the Environment (Protection) (second Amendment) Rules, 1992.
31. You should monitor effluent quality, stack emissions and ambient air quality monthly/quarterly. You shall conduct Dioxin Furan monitoring by third party NABL Accredited agency once in every year and submit report to Sub Regional Officer.
32. The Board reserves its rights to vary all or any of the condition in the consent, if due to any technological improvement or otherwise such variation (including the change of any control equipment, other in whole or in part is necessary).
33. The applicant shall provide facility for collection of environmental samples and samples of trade and sewage effluents, air emissions and hazardous waste to the Board staff at the terminal or designated points and shall pay to the Board for the services rendered in this behalf.
34. You shall obtain necessary prior permission for providing additional control equipment with necessary specifications and operation thereof or alteration or shall ensure replacement of pollution control system or its parts after expiry of its expected life as defined by manufacturer so as to ensure the compliance of standards and safety of the operation thereof.
35. You shall strictly comply with the Water (P&CP) Act, 1974, Air (P&CP) Act, 1981 and Environmental Protection Act, 1986 and industry specific standard under EP Rules 1986 which are available on MPCB website (www.mpcb.gov.in).
36. You shall create the Environmental Cell by appointing an Environmental Engineer and Chemist for looking after day-to-day activities related to compliance of CCA.

37. You should comply with the Hazardous and Other Wastes (M & TM) Rules, 2016 , Bio Medical Waste Management Rules,2016 and submit the Annual Returns as per Rule 6(5) & 20(2) of Hazardous and Other Wastes (M & TM) Rules, 2016 for the preceding year in Form-IV by 30th June of every year

---

This certificate is digitally & electronically signed.

Annexure 8 –Approval document from (NCSDP) of CWC

भारत सरकार
जल शक्ति मंत्रालय
जल संसाधन, नदी विकास
एवं गंगा संरक्षण विभाग केन्द्रीय जल आयोग
नींव अभियांत्रिकी एवं
विशेष विश्लेषण निदेशालय

Government of
Ministry of Jal Shakti
D/o Water Resources, River Development
& Ganga Rejuvenation
Foundation Engineering &
Special Analysis Directorate

No. 2/2/2024/FE&SA/74 Dated: 29/05/24

To,
Sh. Abhijeet Patil
Head-special projects,
Tata Power Co. Ltd.

Sub: Observations of NCSDP Committee on site specific seismic study report of Bhivpuri Pumped Storage Project, Maharashtra

Ref: Your email dated 01.04.2024.

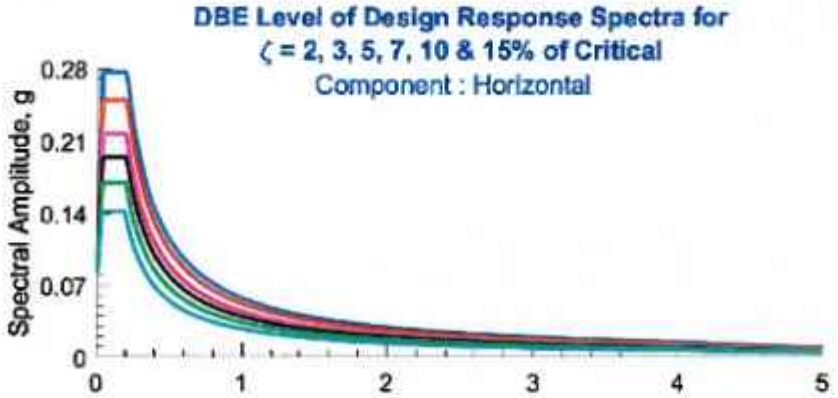
Sir,

This is with reference to the email cited above vide which the site specific seismic study report of the **Bhivpuri Pumped Storage Project, Maharashtra** was submitted to the Secretariat for consideration of the National Committee on Seismic Design Parameters (NCSDP).

In this regard, it is to inform that the committee (NCSDP) in its 38th meeting held on 10.05.2024 considered and discussed the aforesaid mentioned report and the Committee approved the site specific seismic design parameters of lower reservoir of Bhivpuri Pumped Storage Project, Maharashtra, with the upper bound pseudo-static horizontal and vertical seismic coefficients for the dam (αh & αv) at 0.12 and 0.08, respectively.

The summarized approved seismic design parameters of the lower reservoir of Bhivpuri PSP are given below:

(a) Response Spectra (DBE-H) for Bhivpuri PSP site (Lower Dam)



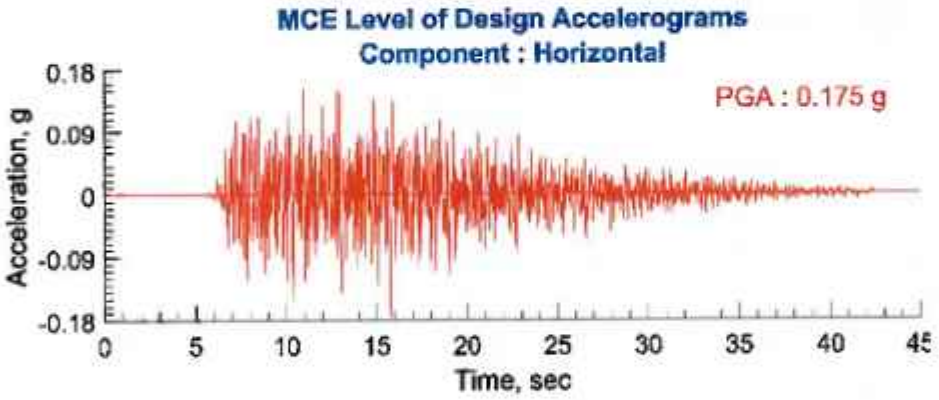
कमरा सं० 2F(N), अष्टम तल, सेवा भवन,
राम कृष्ण पुरम, नई दिल्ली- 110066

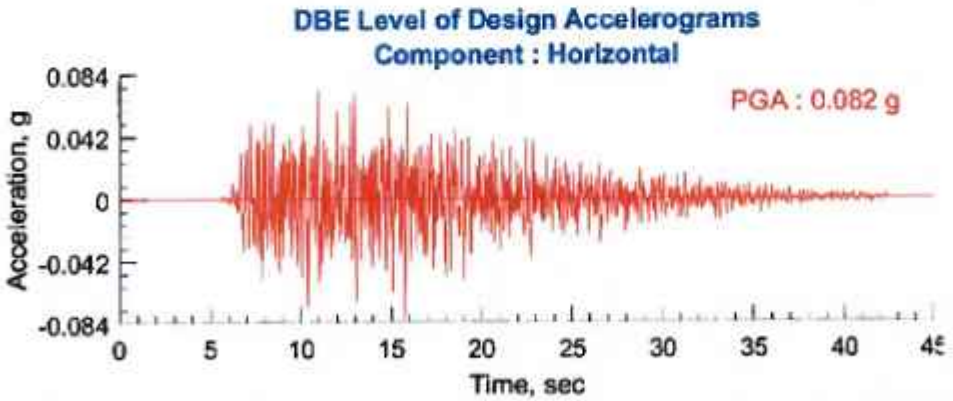
Room 2F(N), 8th Floor, Sewa Bhawan
R. K. Puram, New Delhi-110066 Ph:01129583734

(b) Other seismic parameters

Max. Credible Earthquake	6.5	**Horizontal distance to surface projection of fault (R_{JB}) (km)**	42.65
Horizontal seismic co-efficient (α_h)	0.12	**Vertical seismic co-efficient (α_v)**	0.08
Strong motion duration (second)	8.82		

(c) Time History: As contained in the report for both DBE & MCE for the Bhivpuri PSP site (Lower Dam)





भारत सरकार
जल शक्ति मंत्रालय
जल संसाधन, नदी विकास
एवं गंगा संरक्षण विभाग केन्द्रीय जल आयोग
नींव अभियांत्रिकी एवं
विशेष विश्लेषण निदेशालय

सत्यमेव जयते

Government of
Ministry of Jal Shakti
D/o Water Resources, River Development
& Ganga Rejuvenation
Foundation Engineering &
Special Analysis Directorate

Accordingly, the **lower reservoir** of **Bhivpuri Pumped Storage Project, Maharashtra** may be designed for the approved parameters.

However, the Committee directed to evaluate the site-specific seismic design parameters for the existing upper reservoir and check its stability using the obtained parameters. The site-specific seismic study report for the upper reservoir incorporating the observations above may be submitted to the secretariat for consideration by the committee.

Accordingly, the report of the project, prepared as per the then existing guideline of NCSDP, as per the direction above may be submitted to the secretariat for consideration by the committee.

Yours faithfully

सत्यम अग्रवाल
29/05/24
(Satyam Aggarwal)
Deputy Director (FE&SA)

कमरा सं० 2F(N), अष्टम तल, सेवा भवन,
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भारत सरकार
Government of India
विद्युत मंत्रालय
Ministry of Power
केन्द्रीय विद्युत प्राधिकरण
Central Electricity Authority
जल विद्युत परियोजना मूल्यांकन प्रभाग
Hydro Project Appraisal Division

OFFICE MEMORANDUM

Subject: Accord of Concurrence to Bhivpuri Off-stream Open Loop Pumped Storage Project, 1000 MW (4 x 200 MW + 2 x 100 MW) in Maharashtra by M/s. Tata Power Company Limited under Section 8 of the Electricity Act, 2003 - regarding.

Detailed Project Report (DPR) of the Bhivpuri Off-stream Open Loop Pumped Storage Project, 1000 MW (4x200 MW + 2 x 100 MW) in Maharashtra by M/s. Tata Power Company Limited was uploaded in the DPR Approval Process Monitoring System (DAPMS) portal of CEA on 16.07.2024 for concurrence, as per Guidelines for Acceptance, Examination and Concurrence of Detailed Project Reports for Pumped Storage Schemes Version 3.0. Thereafter, developer has submitted revised DPR to HPA Division, CEA after obtaining all necessary pre-DPR clearances on 05.09.2024.

2. Undersigned is directed to convey the decision of Authority taken in the meeting held on 06.09.2024, to accord concurrence to Bhivpuri Off-stream Open Loop Pumped Storage Project (PSP) in exercise of the powers conferred upon the Authority under Section 8 of the Electricity Act, 2003.

3. The undertaking by M/s. Tata Power Company Limited is attached at **Annex- I**. The salient features of the scheme are given in **Annex-II**.

4. This concurrence is subject to fulfillment of the following conditions: -

i. M/s. Tata Power Company Limited shall comply with the suggestions/ observations of Central Water Commission (CWC) as given in **Annex-III.** Further, M/s. Tata Power Company Limited shall submit the site-specific seismic study report for upper reservoir (existing) of Bhivpuri PSP and get it vetted by NCSDP before taking up any construction activity in the upper reservoir area.
ii. M/s. Tata Power Company Limited shall comply with the suggestions/ observations of Central Electricity Authority (CEA) as given in **Annex-IV**.

iii. M/s. Tata Power Company Limited shall comply with the suggestions/ observations of Geological Survey of India as given in **Annex- V.**

iv. M/s. Tata Power Company Limited shall comply with the suggestions/ observations of CSMRS as given in **Annex-VI.**

v. M/s. Tata Power Company Limited shall communicate results of explorations/ investigations from time to time for appraisal of CEA/ CWC/ GSI/ CSMRS regularly.

vi. Examination of Cost Estimates of Pumped Storage Projects is exempted from Concurrence Process. However, additional chapters as per Guidelines for Formulation of Detailed Project Reports for Pumped Storage Schemes Version 3.0, shall be submitted by M/s. Tata Power Company Limited to the Authority within 60 days from date of uploading the DPR on CEA portal so as to ascertain the project cost in accordance with the limit specified by the Central government from time to time. It will not be vetted by CEA/CWC.

vii. M/s. Tata Power Company Limited shall use the NCSDP approved parameters for design purposes.

viii. In case geological surprises in works of the project are met, M/s. Tata Power Company Limited shall systematically maintain a record of geological surprises and treatment provided. The same may be immediately brought to the knowledge of Standing Committee for matters pertaining to Geological Uncertainties/ Surprises and Natural Disaster Events faced in the Hydroelectric Projects constituted vide OM date 23.10.2023 (**Annex-VII).**

ix. M/s. Tata Power Company Limited shall obtain Environment and Forest clearance from MoEF&CC and shall submit a copy to CEA.

x. M/s. Tata Power Company Limited shall obtain Clearance from National Board of Wildlife and shall submit a copy to CEA, if applicable.

xi. M/s. Tata Power Company Limited shall obtain Land availability certificate before actual start of the project and shall submit a copy to CEA.

xii. M/s. Tata Power Company Limited shall obtain NoC from Ministry of Defence and shall submit a copy to CEA, if applicable.

xiii. If Scheduled Tribe population is getting affected at project site, clearance under Forest Right Act/Ministry of Social Justice & Empowerment/ State Government shall be obtained by M/s. Tata Power Company Limited and shall submit the same to CEA.

xiv. Suitable R&R plan shall be prepared by M/s. Tata Power Company Limited and submitted to MoEF&CC for obtaining their clearance.

xv. M/s. Tata Power Company Limited shall set up a sound and scientific safety management system which shall include:

- Establishing procedures to identify hazards that could give rise to the potential of injury, health impairment or death and measures to control impact of such hazards.
- Setting up an Early Warning System to deal with hazardous events such as Glacial Lake and Landslide Outburst Floods, Earthquakes,

cloudburst, Flash Floods, Avalanches, Dam Break event, etc.

- Establishing Standard Operating Procedure to deal with these hazardous events.

xvi. M/s. Tata Power Company Limited shall obtain clearance from Ministry of Home Affairs regarding participation of foreign companies in tender works packages and shall comply with the conditioned stipulated therein.

xvii. M/s. Tata Power Company Limited shall take measures for averting the flooding of the powerhouse as per conditions contained in **Annex-VIII** and appropriate preventive measures of Disaster Management in case of Dam failure or sudden release of water as per conditions contained in **Annex-IX.**

xviii. M/s. Tata Power Company Limited shall comply with the "Guidelines for participation of foreign Companies in tender work packages of Hydroelectric Projects in sensitive areas, 2009" as issued by Ministry of Power vide letter no. 7/1/2002-DO (NHPC Limited) [Vol.II] dated 03.09.2009 **(Annex-X**).

xix. M/s. Tata Power Company Limited shall deploy modern tools/ software for construction monitoring of the project by establishing IT based monitoring systems and linking the same to CEA network.

xx. M/s. Tata Power Company Limited shall ensure availability of adequate quantities of rock/sand from quarries/excavated muck/burrow areas to meet the requirement of coarse & fine aggregates for both wearing & non-wearing surfaces.

xxi. Fly ash and fly ash based products shall be used in the construction of various works to the extent possible in accordance with MoEF&CC (Erstwhile MoEF) notification dated 14.09.1999 and its amendment dated 27.08.2003 and as revised on 06.11.2008. Construction material surveys shall include the required investigations for use of fly ash and fly ash based products in various works, infrastructure facilities etc. and their feasibility shall be ascertained by M/s. Tata Power Company Limited.

xxii. Information in respect of tying up essential inputs/statutory clearances, results of investigations/ studies shall be submitted by M/s. Tata Power Company Limited to CEA/ CWC/ GSI/ CSMRS on receipt of same from time to time.

xxiii. The broad technical aspects of the project proposal in the project report have been scrutinized in CEA in consultation with CWC, GSI and other concerned agencies. The scrutiny is based on the data, assessment and certificates presented in the report and information/ clarifications received as compliances to the observations on the assumption that the data and information furnished are accurate and have been collected reliably by the project authorities from dependable sources and/or after carrying out detailed surveys and investigations as presented in the report.

xxiv. M/s. Tata Power Company Limited shall comply strictly the "Public Procurement (Preference to make in India) Order, 2017 (PPP-MII Order)" issued by Department of Industrial Policy and Promotion,

Ministry of Commerce & Industry, Govt. of India vide its letter no. P-45021/2/2017-B.E.-II dated 15.06.17. **(Copy enclosed Annex-XI).**

xxv. M/s. Tata Power Company Limited shall register units of the project in e-gen portal and map data on PM Gati Shakti Portal.

xxvi. M/s. Tata Power Company Limited shall strictly comply with the provisions mentioned in Central Electricity Authority regulations for "Safety requirements for construction, operation and maintenance of electrical plants and electrical lines, 2011" and amendment thereof, if any.

xxvii. M/s. Tata Power Company Limited shall strictly comply with the provisions mentioned in Central Electricity Authority regulations for "Measures relating to Safety and Electric Supply, 2023" and amendment thereof, if any.

xxviii. M/s. Tata Power Company Limited shall approach CTU to seek connectivity as per CERC Regulations.

xxix. M/s. Tata Power Company Limited shall submit the updated DPR to the State Govt., Appropriate Electricity Regulatory Commission, Central Transmission Utility and co-basin States within seven days from the date of issue this Office Memorandum.

5. Developer has informed that project is scheduled to be completed in 48 months from zero date, i.e., 01.10.2024.

6. Concurrence is subject to compliance by M/s. Tata Power Company Limited of various policies/ guidelines etc. issued by Govt. of India from time to time.

7. Monthly Status Report of compliance of the conditions stipulated in para 4 of this Concurrence letter shall be submitted by M/s. Tata Power Company Limited to HPA division, CEA.

8. Monthly Progress Report of the project shall be submitted to Hydro Project Monitoring (HPM) Division of CEA. Three (3) copies of half-yearly reports both on physical progress of the scheme and expenditure actually incurred, duly certified by statutory auditors shall be submitted to the Authority till the Commercial Operation Date of the plant. The project authorities shall give free accessibility to CEA officers and staff to have on the spot assessment of various aspects of the project.

9. Monthly status of the project from date of concurrence to date of Commercial Operation (COD) shall be furnished by M/s. Tata Power Company Limited to HPA division, CEA as per the proforma enclosed at **Annex –XII.**

10. In case time gap between Concurrence accorded to the scheme by CEA and award of one of major civil packages (either Dam/ Embankment/ HRT/ Powerhouse) by M/s. Tata Power Company Limited is three years or more, a fresh Concurrence of CEA shall be obtained by M/s Tata Power Company Limited.

Revalidation of Concurrence can also be considered, in case, the reason for delay in award of one of major civil packages (either Dam/

Embankment/ HRT/ Powerhouse) is beyond the control of developer. However, proposal for revalidation shall be submitted three months before the expiry of validity of the Concurrence, which is three years from the date of issue of this Concurrence Memorandum.

11. In case, changes are made in design parameters, during construction, due to site conditions or otherwise, the same shall be submitted to CEA under intimation to concerned appraising Organization (CWC/ GSI/ CSMRS) for their approval at the design stage itself, well before execution of work in the form of Memorandum of Changes (MoC). The execution of such changes shall remain suspended till approval of the Authority on MoC.

12. The Authority reserves the right to revoke the concurrence, if the conditions stipulated in the concurrence letter are not complied with to the satisfaction of the Authority.

This issues with the approval of the Competent Authority.

Encl: Annex I, II, III, IV, V, VI, VII, VIII, IX, X, XI, & XII

(Jyoti Singh),
Deputy Director

To,

1. Chief Hydros, M/s. Tata Power Company Limited, Khopoli Power House, Khalapur, District Raigad, Maharashtra - 410204.
2. Secretary, MoEF&CC, Govt. of India, Paryavaran Bhawan, CGO Complex, Lodhi Road, New Delhi-110003.
3. Chairperson, Central Electricity Regulatory Commission, 3rd & 4th Floor, Chanderlok Building, 36, Janpath, New Delhi-110001.
4. Chairperson, Central Water Commission, Sewa Bhawan, R.K. Puram, New Delhi-110066.
5. Additional Chief Secretary to Government, Department of Energy, Maharashtra, 3rd Floor, Main Building, Mantralay, Mumbai-32. (email: ministertanpure@gmail.com)
6. Chairman-cum-Managing Director, Power Grid Corporation of India Limited, Saudamini, Plot No.2, Sector 29, Gurgaon-122001 (Haryana).
7. Chairman, Central Transmission Utility of India Limited, Floors No. 5-10, Tower 1, Plot No. 16, IRCON International Tower, Institutional Area, Sector 32, Gurugram, Haryana - 122001
8. Adviser (Energy), NITI Aayog, Yojana Bhawan, New Delhi-110001.
9. Member (D&R), Central Water Commission, Sewa Bhawan, RK Puram, New Delhi-110066.
10. Joint Secretary (Hydro), Ministry of Power, Shram Shakti Bhawan, Rafi Marg, New Delhi-110119.

11. Chief Engineer (HPA/ PSP&PA-I/ F&CA/ CD/ Legal/ HPP&I/ HETD&RM/ HPM), CEA, Sewa Bhawan, RK Puram, New Delhi-110066.
12. Chief Engineer Design (NW&S) & Nodal Officer for Single Window Clearance Cell, CWC, Sewa Bhawan (S), RK Puram, New Delhi-110066.
13. Director (LHIM & EPE Division), Geological Survey of India, A-II, Pushpa Bhawan, Madangir Road, New Delhi-110062.
14. Director, CSMRS, Olof Palme Marg, Hauz Khas, New Delhi-110016.
15. Director PA (N) & Nodal Officer for Single Window Clearance Cell, CWC, Sewa Bhawan (S), RK Puram, New Delhi-110066.
16. Director {Hydrology(S)/ Embankment (E&NE)/ HCD (E&NE)/ Gates Design (E&NE)/ FE&SA/ ISM-1/ CA-HWF/ CMC&PM/ Instrumentation}, CWC, Sewa Bhawan (S), RK Puram, New Delhi-110066.

Copy to:

17. Chairperson, Central Electricity Authority, Sewa Bhawan, RK Puram, New Delh-110066.
18. Member (Power System/ Hydro/ Planning/ Grid Operation & Distribution/ Thermal/ Economic & Commercial), CEA, Sewa Bhawan, RK Puram, New Delhi-110066.

***

ASIA ENVIRO LAB INDIA PVT. LTD.

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Job Description : Environmental Testing, ETP/STP Manufacturing, ETP/STP Plant Operation Pollution NOC Etc.

Lab - H1-837, Near Pollution Control Board, RIICO Industrial Area, Bhiwadi, Distt. Khairthal-Tijara (Rajasthan)-301019

Ph. No. : 09694666022, Email : asiaenvirolab@gmail.com, Website : www.asiaenvirolab.com

Test Report

Report No.: AEL/THC/27092025/AA/01	Reporting Date:03/10/2025

Issued to:	
M/s TPL-HCC BHIVPURI PSP JOINT VENTURE (Bhivpuri Pumped Storage Project) Survey No-1, PO-Bhivpuri Camp I Taluka- Karjat I Dist-Raigad I Maharashtra - 410201	**Sample I'd** : AEL/THC/270925/AA/01 **Date** : 27.09.2025 **Period of testing** : 27.09.2025 to 03.10.2025

SAMPLE PARTICULARS:	
Type of the Sample	Ambient Air Sample
Date of Sampling	22.09.2025 to 23.09.2025
Point of Sample Collection	Near Batching Plant
Sample Collected By	Lab Rep.
Purpose of Analysis	Monitoring

SAMPLE OBSERVATIONS	
Sampling flow rate (m^3/min.)	1.21
Period of sampling (minutes)	1448.2
Total volume of air sampled (m^3)	1752.3

Sr. No.	Parameters	Unit	Results	Standards Limit as Per NAAQS	Test Protocol
1	Particulate Matter(PM_{10})	$\mu g/m^3$	79.3	100	IS: 5182,(P-23)
2	Particulate Matter($PM_{2.5}$)	$\mu g/m^3$	41.5	60	IS: 5182,(P-24)
3	Sulphur Dioxide (SO_2)	$\mu g/m^3$	8.6	80	IS: 5182,(P-2)
4	Nitrogen Dioxide (NO_2)	$\mu g/m^3$	26.8	80	IS: 5182,(P-6)
5	Benzene (C_6H_6)	$\mu g/m^3$	<1.0	5	IS: 5182 (P-11)
6	Ozone(O_3)	$\mu g/m^3$	23.5	180	IS: 5182,(P-9)
7	Lead (Pb)	$\mu g/m^3$	<0.5	1	IS: 5182(P-22)
8	Arsenic (As)	ng/m^3	<0.02	6	AEL/SOP/AA/01, SOP No.-01, Issue Date:20.12.2024
9	Nickel (Ni)	ng/m^3	<0.02	20	AEL/SOP/AA/01, SOP No.-01, Issue Date:20.12.2024
10	Ammonia(NH_3)	$\mu g/m^3$	<20	400	IS: 5182,(P-25)
11	Benzopyrene (BaP)	ng/m^3	<0.001	1	IS: 5182 (P-12)
12	Carbon Monoxide (CO)	mg/m^3	0.80	4	IS: 5182,(P-10)

Remark:-NAAQS-National Ambient Air Quality Standards

*******End of Test Report*******

Checked By

Authorized Signatory

Note: 1. The result listed refer only to the tested samples and applicable parameters.
2. Sample will be destroyed one month from the date of issue of test certificate.
3. Any complaints about this report should be communicated within 7 days of issue of this report.
4. The report is Not to be reproduced wholly or in part and can Not be used as an evidence in the Court of law and should Not be used in any advertising Media without our special permission in writing.

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Lab - H1-837, Near Pollution Control Board, RIICO Industrial Area, Bhiwadi, Distt. Khairthal-Tijara (Rajasthan)-301019

Ph. No. : 09694666022, Email : asiaenvirolab@gmail.com, Website : www.asiaenvirolab.com

Test Report

Report No.: AEL/THC/27092025/AA/02	Reporting Date:03/10/2025

Issued to:	
M/s TPL-HCC BHIVPURI PSP JOINT VENTURE (Bhivpuri Pumped Storage Project) Survey No-1, PO-Bhivpuri Camp I Taluka- Karjat I Dist-Raigad I Maharashtra - 410201	**Sample I'd** : AEL/THC/270925/AA/02 **Date** : 27.09.2025 **Period of testing** : 27.09.2025 to 03.10.2025

SAMPLE PARTICULARS:	
Type of the Sample	Ambient Air Sample
Date of Sampling	22.09.2025 to 23.09.2025
Point of Sample Collection	Near WRD Plant
Sample Collected By	Lab Rep.
Purpose of Analysis	Monitoring

SAMPLE OBSERVATIONS	
Sampling flow rate (m^3/min.)	1.18
Period of sampling (minutes)	1445.0
Total volume of air sampled (m^3)	1705.1

Sr. No.	Parameters	Unit	Results	Standards Limit as Per NAAQS	Test Protocol
1	Particulate Matter(PM_{10})	$\mu g/m^3$	74.5	100	IS: 5182,(P-23)
2	Particulate Matter($PM_{2.5}$)	$\mu g/m^3$	38.6	60	IS: 5182,(P-24)
3	Sulphur Dioxide (SO_2)	$\mu g/m^3$	7.9	80	IS: 5182,(P-2)
4	Nitrogen Dioxide (NO_2)	$\mu g/m^3$	24.9	80	IS: 5182,(P-6)
5	Benzene (C_6H_6)	$\mu g/m^3$	<1.0	5	IS: 5182 (P-11)
6	Ozone(O_3)	$\mu g/m^3$	23.2	180	IS: 5182,(P-9)
7	Lead (Pb)	$\mu g/m^3$	<0.5	1	IS: 5182(P-22)
8	Arsenic (As)	ng/m^3	<0.02	6	AEL/SOP/AA/01, SOP No.-01, Issue Date:20.12.2024
9	Nickel (Ni)	ng/m^3	<0.02	20	AEL/SOP/AA/01, SOP No.-01, Issue Date:20.12.2024
10	Ammonia(NH_3)	$\mu g/m^3$	<20	400	IS: 5182,(P-25)
11	Benzopyrene (BaP)	ng/m^3	<0.001	1	IS: 5182 (P-12)
12	Carbon Monoxide (CO)	mg/m^3	0.73	4	IS: 5182,(P-10)

Remark:-NAAQS-National Ambient Air Quality Standards

*******End of Test Report*******

Checked By

Authorized Signatory

Note: 1. The result listed refer only to the tested samples and applicable parameters.
2. Sample will be destroyed one month from the date of issue of test certificate.
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Ph. No. : 09694666022, Email : asiaenvirolab@gmail.com, Website : www.asiaenvirolab.com

Test Report

Report No.: AEL/THC/27092025/AA/03	Reporting Date:03/10/2025

Issued to:	
M/s TPL-HCC BHIVPURI PSP JOINT VENTURE (Bhivpuri Pumped Storage Project)	**Sample I'd** : AEL/THC/270925/AA/03 **Date** : 27.09.2025 **Period of testing** : 27.09.2025 to 03.10.2025
Survey No-1, PO-Bhivpuri Camp I Taluka- Karjat I Dist-Raigad I Maharashtra - 410201	

SAMPLE PARTICULARS:	
Type of the Sample	Ambient Air Sample
Date of Sampling	24.09.2025 to 25.09.2025
Point of Sample Collection	Nearby Office Area
Sample Collected By	Lab Rep.
Purpose of Analysis	Monitoring

SAMPLE OBSERVATIONS	
Sampling flow rate (m^3/min.)	1.16
Period of sampling (minutes)	1442.8
Total volume of air sampled (m^3)	1673.6

Sr. No.	Parameters	Unit	Results	Standards Limit as Per NAAQS	Test Protocol
1	Particulate Matter(PM_{10})	$\mu g/m^3$	69.8	100	IS: 5182,(P-23)
2	Particulate Matter($PM_{2.5}$)	$\mu g/m^3$	35.4	60	IS: 5182,(P-24)
3	Sulphur Dioxide (SO_2)	$\mu g/m^3$	6.2	80	IS: 5182,(P-2)
4	Nitrogen Dioxide (NO_2)	$\mu g/m^3$	24.8	80	IS: 5182,(P-6)
5	Benzene (C_6H_6)	$\mu g/m^3$	<1.0	5	IS: 5182 (P-11)
6	Ozone(O_3)	$\mu g/m^3$	23.3	180	IS: 5182,(P-9)
7	Lead (Pb)	$\mu g/m^3$	<0.5	1	IS: 5182(P-22)
8	Arsenic (As)	ng/m^3	<0.02	6	AEL/SOP/AA/01, SOP No.-01, Issue Date:20.12.2024
9	Nickel (Ni)	ng/m^3	<0.02	20	AEL/SOP/AA/01, SOP No.-01, Issue Date:20.12.2024
10	Ammonia(NH_3)	$\mu g/m^3$	<20	400	IS: 5182,(P-25)
11	Benzopyrene (BaP)	ng/m^3	<0.001	1	IS: 5182 (P-12)
12	Carbon Monoxide (CO)	mg/m^3	0.63	4	IS: 5182,(P-10)

Remark:-NAAQS-National Ambient Air Quality Standards

*******End of Test Report*******

Checked By

Authorized Signatory

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ASIA ENVIRO LAB INDIA PVT. LTD.

(An ISO 9001:2015, 14001:2015, 45001:2018, CPCB & NABL Recognised Lab)

Job Description : Environmental Testing, ETP/STP Manufacturing, ETP/STP Plant Operation Pollution NOC Etc.

Lab - H1-837, Near Pollution Control Board, RIICO Industrial Area, Bhiwadi, Distt. Khairthal-Tijara (Rajasthan)-301019

Ph. No. : 09694566022, Email : asiaenvirolab@gmail.com, Website : www.asiaenvirolab.com

Test Report

Report No.: AEL/THC/27092025/AA/04	Reporting Date:03/10/2025

Issued to:	
M/s TPL-HCC BHIVPURI PSP JOINT VENTURE (Bhivpuri Pumped Storage Project) Survey No-1, PO-Bhivpuri Camp I Taluka- Karjat I Dist-Raigad I Maharashtra - 410201	**Sample I'd** : AEL/THC/270925/AA/04 **Date** : 27.09.2025 **Period of testing** : 27.09.2025 to 03.10.2025

SAMPLE PARTICULARS:	
Type of the Sample	Ambient Air Sample
Date of Sampling	24.09.2025 to 25.09.2025
Point of Sample Collection	Near Crusher Plant
Sample Collected By	Lab Rep.
Purpose of Analysis	Monitoring

SAMPLE OBSERVATIONS	
Sampling flow rate (m^3/min.)	1.19
Period of sampling (minutes)	1450.0
Total volume of air sampled (m^3)	1725.5

Sr. No.	Parameters	Unit	Results	Standards Limit as Per NAAQS	Test Protocol
1	Particulate Matter(PM_{10})	$\mu g/m^3$	82.3	100	IS: 5182,(P-23)
2	Particulate Matter($PM_{2.5}$)	$\mu g/m^3$	43.6	60	IS: 5182,(P-24)
3	Sulphur Dioxide (SO_2)	$\mu g/m^3$	10.8	80	IS: 5182,(P-2)
4	Nitrogen Dioxide (NO_2)	$\mu g/m^3$	25.9	80	IS: 5182,(P-6)
5	Benzene (C_6H_6)	$\mu g/m^3$	<1.0	5	IS: 5182 (P-11)
6	Ozone(O_3)	$\mu g/m^3$	23.1	180	IS: 5182,(P-9)
7	Lead (Pb)	$\mu g/m^3$	<0.5	1	IS: 5182(P-22)
8	Arsenic (As)	ng/m^3	<0.02	6	AEL/SOP/AA/01, SOP No.-01, Issue Date:20.12.2024
9	Nickel (Ni)	ng/m^3	<0.02	20	AEL/SOP/AA/01, SOP No.-01, Issue Date:20.12.2024
10	Ammonia(NH_3)	$\mu g/m^3$	<20	400	IS: 5182,(P-25)
11	Benzopyrene (BaP)	ng/m^3	<0.001	1	IS: 5182 (P-12)
12	Carbon Monoxide (CO)	mg/m^3	0.89	4	IS: 5182,(P-10)

Remark:-NAAQS-National Ambient Air Quality Standards

*******End of Test Report*******

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Ph. No. : 09694666022, Email : asiaenvirolab@gmail.com, Website : www.asiaenvirolab.com

Test Report

Report No.: AEL/THC/27092025/AN/01	Reporting Date:03/10/2025

Issued to:	Sample I'd : AEL/THC/270925/AN/01
M/s TPL-HCC BHIVPURI PSP JOINT VENTURE (Bhivpuri Pumped Storage Project)	Date : 27.09.2025
Survey No-1, PO-Bhivpuri Camp I Taluka- Karjat I Dist-Raigad I Maharashtra - 410201	

SAMPLE PARTICULARS:	
Type of the Sample	Noise Level Testing (Ambient Air Quality in respect of Noise)
Date of Sampling	22.09.2025 to 23.09.2025
Sample Collected By	Lab Rep.
Purpose of Analysis	Monitoring

Sr. No.	Sampling Location	Units	Results		Protocol Used
			Day	Night	
1.	Near Batching Plant	dB(A)	52.6	38.4	IS 9989 (By Calculation):2014

Area Code	Category of Area/Zone	Limit as per E(P)A 1986 (The Noise Pollution Regulation & Control Rule, 2006) in dB (A) Leq.	
		Day Time	Night Time
A	Industrial Area	75	70
B	Commercial Area	65	55
C	Residential Area	55	45
D	Silence Zone	50	40

Note: -* Day time mean 6:00 am to 10:00 pm
** Night Time mean 10:00 pm to 6:00 am

*******End of Test Report*******

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Test Report

Report No.: AEL/THC/27092025/AN/02	Reporting Date:03/10/2025

Issued to:	Sample I'd : AEL/THC/270925/AN/02
M/s TPL-HCC BHIVPURI PSP JOINT VENTURE (Bhivpuri Pumped Storage Project)	Date : 27.09.2025
Survey No-1, PO-Bhivpuri Camp I Taluka- Karjat I Dist-Raigad I Maharashtra - 410201	

SAMPLE PARTICULARS:	
Type of the Sample	Noise Level Testing (Ambient Air Quality in respect of Noise)
Date of Sampling	22.09.2025 to 23.09.2025
Sample Collected By	Lab Rep.
Purpose of Analysis	Monitoring

Sr. No.	Sampling Location	Units	Results		Protocol Used
			Day	Night	
1.	Near WRD Plant	dB(A)	54.3	45.6	IS 9989 (By Calculation):2014

Area Code	Category of Area/Zone	Limit as per E(P)A 1986 (The Noise Pollution Regulation & Control Rule, 2006) in dB (A) Leq.	
		Day Time	Night Time
A	Industrial Area	75	70
B	Commercial Area	65	55
C	Residential Area	55	45
D	Silence Zone	50	40

Note: -* Day time mean 6:00 am to 10:00 pm
** Night Time mean 10:00 pm to 6:00 am

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Test Report

Report No.: AEL/THC/27092025/AN/03	Reporting Date:03/10/2025

Issued to:	Sample I'd : AEL/THC/270925/AN/03
M/s TPL-HCC BHIVPURI PSP JOINT VENTURE	Date : 27.09.2025
(Bhivpuri Pumped Storage Project)	
Survey No-1, PO-Bhivpuri Camp I Taluka- Karjat I Dist-Raigad I Maharashtra - 410201	

SAMPLE PARTICULARS:	
Type of the Sample	Noise Level Testing (Ambient Air Quality in respect of Noise)
Date of Sampling	24.09.2025 to 25.09.2025
Sample Collected By	Lab Rep.
Purpose of Analysis	Monitoring

Sr. No.	Sampling Location	Units	Results		Protocol Used
			Day	Night	
1.	Nearby Office Area	dB(A)	45.6	33.8	IS 9989 (By Calculation):2014

Area Code	Category of Area/Zone	Limit as per E(P)A 1986 (The Noise Pollution Regulation & Control Rule, 2006) in dB (A) Leq.	
		Day Time	Night Time
A	Industrial Area	75	70
B	Commercial Area	65	55
C	Residential Area	55	45
D	Silence Zone	50	40

Note: -* Day time mean 6:00 am to 10:00 pm

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Test Report

Report No.: AEL/THC/27092025/AN/04	Reporting Date:03/10/2025

Issued to:	Sample I'd : AEL/THC/270925/AN/04
M/s TPL-HCC BHIVPURI PSP JOINT VENTURE (Bhivpuri Pumped Storage Project)	Date : 27.09.2025
Survey No-1, PO-Bhivpuri Camp I Taluka- Karjat I Dist-Raigad I Maharashtra - 410201	

SAMPLE PARTICULARS:	
Type of the Sample	Noise Level Testing (Ambient Air Quality in respect of Noise)
Date of Sampling	24.09.2025 to 25.09.2025
Sample Collected By	Lab Rep.
Purpose of Analysis	Monitoring

Sr. No.	Sampling Location	Units	Results		Protocol Used
			Day	Night	
1.	Near Crusher Plant	dB(A)	55.8	39.8	IS 9989 (By Calculation):2014

Area Code	Category of Area/Zone	Limit as per E(P)A 1986 (The Noise Pollution Regulation & Control Rule, 2006) in dB (A) Leq.	
		Day Time	Night Time
A	Industrial Area	75	70
B	Commercial Area	65	55
C	Residential Area	55	45
D	Silence Zone	50	40

Note: -* Day time mean 6:00 am to 10:00 pm
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Test Report

Report No.: AEL/THC/27092025/ST/01	Reporting Date:03/10/2025

Issued to:	
M/s TPL-HCC BHIVPURI PSP JOINT VENTURE (Bhivpuri Pumped Storage Project) Survey No-1, PO-Bhivpuri Camp I Taluka- Karjat I Dist-Raigad I Maharashtra - 410201	**Sample I'd** : AEL/THC/270925/ST/01 **Date** : 27.09.2025 **Period of testing** : 27.09.2025 to 03.10.2025

SAMPLE PARTICULARS:	
Type of the Sample	D.G. Stack Emission
Date of Sampling	23.09.2025
Name of Plant/Location	WRD Area
Capacity of D.G	125 KVA
Type of Fuel Used	Diesel
Stack height(From the Ground level)	15 Feet
Stack Dia	4 Inch
Sample Collected By	Lab Rep.
Purpose of Analysis	Monitoring

SAMPLE OBSERVATIONS	
Ambient Temperature, °C	33
Stack Temperature, °C	139
Flue gas velocity, m/sec	12.8
Sampling flow rate, liter per minute	19
Volumetric flow rate, $Nm^3/hr.$	259.65

Sr. No.	Parameters	Unit	Results	Standards Limit (as per CPCB)	Test Protocol
1	PM(Particulate Matter)	gm/kwh	0.106	0.2	IS 11255(P-1)
2	Oxides of Nitrogen(NO_x)	gm/kwh	0.471	4.0	IS 11255(P-7)
3	Hydro Carbon(HC)	gm/kwh	0.074		IS 13270
4	Carbon Monoxide(CO)	gm/kwh	0.158	3.5	AEL/SOP/ST/01, SOP No.-01, Issue Date:-20.12.2024

Remark:-CPCB-Central Pollution Control Board.

*******End of Test Report*******

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Test Report

Report No.: AEL/THC/27092025/ST/02	Reporting Date:03/10/2025

Issued to:	
M/s TPL-HCC BHIVPURI PSP JOINT VENTURE (Bhivpuri Pumped Storage Project) Survey No-1, PO-Bhivpuri Camp I Taluka- Karjat I Dist-Raigad I Maharashtra - 410201	**Sample I'd** : AEL/THC/270925/ST/02 **Date** : 27.09.2025 **Period of testing** : 27.09.2025 to 03.10.2025

SAMPLE PARTICULARS:	
Type of the Sample	D.G. Stack Emission
Date of Sampling	23.09.2025
Name of Plant/Location	Batching Plant
Capacity of D.G	500 KVA
Type of Fuel Used	Diesel
Stack height(From the Ground level)	12 Feet
Stack Dia	8 Inch
Sample Collected By	Lab Rep.
Purpose of Analysis	Monitoring

SAMPLE OBSERVATIONS	
Ambient Temperature, °C	33
Stack Temperature, °C	172
Flue gas velocity, m/sec	11.1
Sampling flow rate, liter per minute	15
Volumetric flow rate, $Nm^3/hr.$	833.88

Sr. No.	Parameters	Unit	Results	Standards Limit (as per CPCB)	Test Protocol
1	PM(Particulate Matter)	gm/kwh	0.098	0.2	IS 11255(P-1)
2	Oxides of Nitrogen(NO_x)	gm/kwh	0.385	4.0	IS 11255(P-7)
3	Hydro Carbon(HC)	gm/kwh	0.064		IS 13270
4	Carbon Monoxide(CO)	gm/kwh	0.169	3.5	AEL/SOP/ST/01, SOP No.-01, Issue Date:-20.12.2024

Remark:-CPCB-Central Pollution Control Board.

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Test Report

Report No.: AEL/THC/27092025/ST/03	Reporting Date:03/10/2025

Issued to:	
M/s TPL-HCC BHIVPURI PSP JOINT VENTURE (Bhivpuri Pumped Storage Project) Survey No-1, PO-Bhivpuri Camp I Taluka- Karjat I Dist-Raigad I Maharashtra - 410201	**Sample I'd** : AEL/THC/270925/ST/03 **Date** : 27.09.2025 **Period of testing** : 27.09.2025 to 03.10.2025

SAMPLE PARTICULARS:	
Type of the Sample	D.G. Stack Emission
Date of Sampling	23.09.2025
Name of Plant/Location	Lower Reservoir
Capacity of D.G	62.5 KVA
Type of Fuel Used	Diesel
Stack height(From the Ground level)	6 Feet
Stack Dia	4 Inch
Sample Collected By	Lab Rep.
Purpose of Analysis	Monitoring

SAMPLE OBSERVATIONS	
Ambient Temperature, °C	33
Stack Temperature, °C	109
Flue gas velocity, m/sec	13.8
Sampling flow rate, liter per minute	22
Volumetric flow rate, $Nm^3/hr.$	301.92

Sr. No.	Parameters	Unit	Results	Standards Limit (as per CPCB)	Test Protocol
1	PM(Particulate Matter)	gm/kwh	0.209	0.3	IS 11255(P-1)
2	Oxides of Nitrogen(NO_x)	gm/kwh	0.812	4.7	IS 11255(P-7)
3	Hydro Carbon(HC)	gm/kwh	0.092		IS 13270
4	Carbon Monoxide(CO)	gm/kwh	0.196	3.5	AEL/SOP/ST/01, SOP No.-01, Issue Date:-20.12.2024

Remark:-CPCB-Central Pollution Control Board.

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Test Report

Report No.: AEL/THC/27092025/ST/04	Reporting Date:03/10/2025

Issued to:	
M/s TPL-HCC BHIVPURI PSP JOINT VENTURE (Bhivpuri Pumped Storage Project) Survey No-1, PO-Bhivpuri Camp I Taluka- Karjat I Dist-Raigad I Maharashtra - 410201	**Sample I'd** : AEL/THC/270925/ST/04 **Date** : 27.09.2025 **Period of testing** : 27.09.2025 to 03.10.2025

SAMPLE PARTICULARS:	
Type of the Sample	D.G. Stack Emission
Date of Sampling	23.09.2025
Name of Plant/Location	Power House
Capacity of D.G	62.5 KVA
Type of Fuel Used	Diesel
Stack height(From the Ground level)	6 Feet
Stack Dia	4 Inch
Sample Collected By	Lab Rep.
Purpose of Analysis	Monitoring

SAMPLE OBSERVATIONS	
Ambient Temperature, °C	32
Stack Temperature, °C	117
Flue gas velocity, m/sec	13.3
Sampling flow rate, liter per minute	21
Volumetric flow rate, $Nm^3/hr.$	285.01

Sr. No.	Parameters	Unit	Results	Standards Limit (as per CPCB)	Test Protocol
1	PM(Particulate Matter)	gm/kwh	0.156	0.3	IS 11255(P-1)
2	Oxides of Nitrogen(NO_x)	gm/kwh	0.950	4.7	IS 11255(P-7)
3	Hydro Carbon(HC)	gm/kwh	0.104		IS 13270
4	Carbon Monoxide(CO)	gm/kwh	0.294	3.5	AEL/SOP/ST/01, SOP No.-01, Issue Date:-20.12.2024

Remark:-CPCB-Central Pollution Control Board.

*******End of Test Report*******

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Authorized Signatory

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Test Report

Report No.: AEL/THC/27092025/ST/05	Reporting Date:03/10/2025

Issued to:	
M/s TPL-HCC BHIVPURI PSP JOINT VENTURE (Bhivpuri Pumped Storage Project) Survey No-1, PO-Bhivpuri Camp I Taluka- Karjat I Dist-Raigad I Maharashtra - 410201	**Sample I'd** : AEL/THC/270925/ST/05 **Date** : 27.09.2025 **Period of testing** : 27.09.2025 to 03.10.2025

SAMPLE PARTICULARS:	
Type of the Sample	D.G. Stack Emission
Date of Sampling	24.09.2025
Name of Plant/Location	Crusher Plant
Capacity of D.G	5 KVA (CPCB-IV*)
Type of Fuel Used	Diesel
Stack height(From the Ground level)	5 Feet
Stack Dia	2 Inch from Mouth
Sample Collected By	Lab Rep.
Purpose of Analysis	Monitoring

SAMPLE OBSERVATIONS	
Ambient Temperature, °C	32
Stack Temperature, °C	96
Flue gas velocity, m/sec	14.5
Sampling flow rate, liter per minute	24
Volumetric flow rate, $Nm^3/hr.$	82.10

Sr. No.	Parameters	Unit	Results	Standards Limit (as per CPCB)	Test Protocol
1	PM(Particulate Matter)	gm/kwh	0.215	0.3	IS 11255(P-1)
2	Oxides of Nitrogen(NO_x)	gm/kwh	1.274	7.5	IS 11255(P-7)
3	Hydro Carbon(HC)	gm/kwh	0.130		IS 13270
4	Carbon Monoxide(CO)	gm/kwh	0.379	3.5	AEL/SOP/ST/01, SOP No.-01, Issue Date:-20.12.2024

Remark:-CPCB-Central Pollution Control Board.

*******End of Test Report*******

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ASIA ENVIRO LAB INDIA PVT. LTD.

(An ISO 9001:2015, 14001:2015, 45001:2018, CPCB & NABL Recognised Lab)

Job Description : Environmental Testing, ETP/STP Manufacturing, ETP/STP Plant Operation Pollution NOC Etc.

Lab - H1-837, Near Pollution Control Board, RIICO Industrial Area, Bhiwadi, Distt. Khairthal-Tijara (Rajasthan)-301019

Ph. No. : 09694666022, Email : asiaenvirolab@gmail.com, Website : www.asiaenvirolab.com

Test Report

Report No.: AEL/THC/27092025/ST/06	Reporting Date:03/10/2025

Issued to:	
M/s TPL-HCC BHIVPURI PSP JOINT VENTURE (Bhivpuri Pumped Storage Project) Survey No-1, PO-Bhivpuri Camp I Taluka- Karjat I Dist-Raigad I Maharashtra - 410201	**Sample I'd** : AEL/THC/270925/ST/06 **Date** : 27.09.2025 **Period of testing** : 27.09.2025 to 03.10.2025

SAMPLE PARTICULARS:	
Type of the Sample	D.G. Stack Emission
Date of Sampling	24.09.2025
Name of Plant/Location	Crusher Plant
Capacity of D.G	40 KVA
Type of Fuel Used	Diesel
Stack height(From the Ground level)	6 Feet
Stack Dia	4 Inch
Sample Collected By	Lab Rep.
Purpose of Analysis	Monitoring

SAMPLE OBSERVATIONS	
Ambient Temperature, °C	32
Stack Temperature, °C	109
Flue gas velocity, m/sec	13.4
Sampling flow rate, liter per minute	21
Volumetric flow rate, $Nm^3/hr.$	293.17

Sr. No.	Parameters	Unit	Results	Standards Limit (as per CPCB)	Test Protocol
1	PM(Particulate Matter)	gm/kwh	0.190	0.2	IS 11255(P-1)
2	Oxides of Nitrogen(NO_x)	gm/kwh	0.651	4.0	IS 11255(P-7)
3	Hydro Carbon(HC)	gm/kwh	0.076		IS 13270
4	Carbon Monoxide(CO)	gm/kwh	0.268	3.5	AEL/SOP/ST/01, SOP No.-01, Issue Date:-20.12.2024

Remark:-CPCB-Central Pollution Control Board.

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Ph. No. : 09694666022, Email : aslaenvirolab@gmail.com, Website : www.aslaenvirolab.com

Test Report

Report No.: AEL/THC/27092025/ST/07	Reporting Date:03/10/2025

Issued to:	
M/s TPL-HCC BHIVPURI PSP JOINT VENTURE (Bhivpuri Pumped Storage Project) Survey No-1, PO-Bhivpuri Camp I Taluka- Karjat I Dist-Raigad I Maharashtra - 410201	**Sample I'd** : AEL/THC/270925/ST/07 **Date** : 27.09.2025 **Period of testing** : 27.09.2025 to 03.10.2025

SAMPLE PARTICULARS:	
Type of the Sample	D.G. Stack Emission
Date of Sampling	24.09.2025
Name of Plant/Location	Dumping Yard
Capacity of D.G	5 KVA
Type of Fuel Used	Diesel
Stack height(From the Ground level)	3 Feet
Stack Dia	4 Inch
Sample Collected By	Lab Rep.
Purpose of Analysis	Monitoring

SAMPLE OBSERVATIONS	
Ambient Temperature, °C	31
Stack Temperature, °C	75
Flue gas velocity, m/sec	14.2
Sampling flow rate, liter per minute	25
Volumetric flow rate, $Nm^3/hr.$	341.03

Sr. No.	Parameters	Unit	Results	Standards Limit (as per CPCB)	Test Protocol
1	PM(Particulate Matter)	gm/kwh	0.217	0.3	IS 11255(P-1)
2	Oxides of Nitrogen(NO_x)	gm/kwh	1.845	7.5	IS 11255(P-7)
3	Hydro Carbon(HC)	gm/kwh	0.184		IS 13270
4	Carbon Monoxide(CO)	gm/kwh	0.348	3.5	AEL/SOP/ST/01, SOP No.-01, Issue Date:-20.12.2024

Remark:-CPCB-Central Pollution Control Board.

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Lab - H1-837, Near Pollution Control Board, RIICO Industrial Area, Bhiwadi, Distt. Khairthal-Tijara (Rajasthan)-301019

Ph. No. : 09694666022, Email : asiaenvirolab@gmail.com, Website : www.asiaenvirolab.com

Test Report

Report No.: AEL/THC/27092025/ST/08	Reporting Date:03/10/2025

Issued to:	
M/s TPL-HCC BHIVPURI PSP JOINT VENTURE (Bhivpuri Pumped Storage Project) Survey No-1, PO-Bhivpuri Camp I Taluka- Karjat I Dist-Raigad I Maharashtra - 410201	**Sample I'd** : AEL/THC/270925/ST/08 **Date** : 27.09.2025 **Period of testing** : 27.09.2025 to 03.10.2025

SAMPLE PARTICULARS:	
Type of the Sample	D.G. Stack Emission
Date of Sampling	24.09.2025
Name of Plant/Location	Near Batching Plant
Capacity of D.G	7.5 KVA
Type of Fuel Used	Diesel
Stack height(From the Ground level)	10 Feet
Stack Dia	4 Inch
Sample Collected By	Lab Rep.
Purpose of Analysis	Monitoring

SAMPLE OBSERVATIONS	
Ambient Temperature, °C	31
Stack Temperature, °C	81
Flue gas velocity, m/sec	13.6
Sampling flow rate, liter per minute	23
Volumetric flow rate, $Nm^3/hr.$	315.73

Sr. No.	Parameters	Unit	Results	Standards Limit (as per CPCB)	Test Protocol
1	PM (Particulate Matter)	gm/kwh	0.209	0.3	IS 11255(P-1)
2	Oxides of Nitrogen(NO_x)	gm/kwh	1.690	7.5	IS 11255(P-7)
3	Hydro Carbon (HC)	gm/kwh	0.154		IS 13270
4	Carbon Monoxide(CO)	gm/kwh	0.248	3.5	AEL/SOP/ST/01, SOP No.-01, Issue Date:-20.12.2024

Remark:-CPCB-Central Pollution Control Board.

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Test Report

Report No.: AEL/THC/27092025/ST/09	Reporting Date:03/10/2025

Issued to:	
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SAMPLE PARTICULARS:	
Type of the Sample	D.G. Stack Emission
Date of Sampling	23.09.2025
Name of Plant/Location	Office Back Side
Capacity of D.G	35 KVA
Type of Fuel Used	Diesel
Stack height(From the Ground level)	6 Feet
Stack Dia	4 Inch
Sample Collected By	Lab Rep.
Purpose of Analysis	Monitoring

SAMPLE OBSERVATIONS	
Ambient Temperature, °C	31
Stack Temperature, °C	108
Flue gas velocity, m/sec	13.5
Sampling flow rate, liter per minute	21
Volumetric flow rate, $Nm^3/hr.$	296.13

Sr. No.	Parameters	Unit	Results	Standards Limit (as per CPCB)	Test Protocol
1	PM(Particulate Matter)	gm/kwh	0.166	0.3	IS 11255(P-1)
2	Oxides of Nitrogen(NO_x)	gm/kwh	1.354	4.7	IS 11255(P-7)
3	Hydro Carbon(HC)	gm/kwh	0.098		IS 13270
4	Carbon Monoxide(CO)	gm/kwh	0.257	3.5	AEL/SOP/ST/01, SOP No.-01, Issue Date:-20.12.2024

Remark:-CPCB-Central Pollution Control Board.

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Test Report

Report No.: AEL/THC/27092025/ST/10	Reporting Date:03/10/2025

Issued to:	
M/s TPL-HCC BHIVPURI PSP JOINT VENTURE (Bhivpuri Pumped Storage Project) Survey No-1, PO-Bhivpuri Camp I Taluka- Karjat I Dist-Raigad I Maharashtra - 410201	**Sample I'd** : AEL/THC/270925/ST/10 **Date** : 27.09.2025 **Period of testing** : 27.09.2025 to 03.10.2025

SAMPLE PARTICULARS:	
Type of the Sample	D.G. Stack Emission
Date of Sampling	26.09.2025
Name of Plant/Location	Shanti Forest Area
Capacity of D.G	40 KVA
Type of Fuel Used	Diesel
Stack height(From the Ground level)	12 Feet
Stack Dia	4 Inch
Sample Collected By	Lab Rep.
Purpose of Analysis	Monitoring

SAMPLE OBSERVATIONS	
Ambient Temperature, °C	31
Stack Temperature, °C	90
Flue gas velocity, m/sec	13.3
Sampling flow rate, liter per minute	22.1
Volumetric flow rate, $Nm^3/hr.$	306.21

Sr. No.	Parameters	Unit	Results	Standards Limit (as per CPCB)	Test Protocol
1	PM(Particulate Matter)	gm/kwh	0.199	0.3	IS 11255(P-1)
2	Oxides of Nitrogen(NO_x)	gm/kwh	1.132	7.5	IS 11255(P-7)
3	Hydro Carbon(HC)	gm/kwh	0.134		IS 13270
4	Carbon Monoxide(CO)	gm/kwh	0.396	3.5	AEL/SOP/ST/01, SOP No.-01, Issue Date:-20.12.2024

Remark:-CPCB-Central Pollution Control Board.

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Test Report

Report No.: AEL/THC/27092025/DN/01	Reporting Date:03/10/2025

Issued to:	Sample I'd : AEL/THC/270925/DN/01
M/s TPL-HCC BHIVPURI PSP JOINT VENTURE (Bhivpuri Pumped Storage Project)	Date : 27.09.2025
Survey No-1, PO-Bhivpuri Camp I Taluka- Karjat I Dist-Raigad I Maharashtra - 410201	

SAMPLE PARTICULARS:	
Type of the Sample	DG Noise Level
Date of Sampling	23.09.2025
Name of Plant/Location	WRD Area
Sample Collected By	Lab Rep.
Purpose of Analysis	Monitoring
Test Protocol	IS: 4758

TEST RESULTS:

Sr. No.	Location	Unit	Minimum	Maximum	Average	Insertion Loss	Limit as per CPCB
1	DG Set-125 KVA (Canopy door Open)	(dB)A	93.4	96.8	95.1	26.3	Minimum insertion loss should be 25 dB(A) or maximum 75 dB(A) at the outside of DG room and Sets
2	DG Set-125 KVA (Canopy door Closed)	(dB)A	67.2	70.4	68.8		

Remark:-Open & Close the Canopy of D.G Set, (0.5 meter Distance)
CPCB-Central Pollution Control Board.

*******End of Test Report*******

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Lab - H1-837, Near Pollution Control Board, RIICO Industrial Area, Bhiwadi, Distt. Khairthal-Tijara (Rajasthan)-301019

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Test Report

Report No.: AEL/THC/27092025/DN/02	Reporting Date:03/10/2025

Issued to:	Sample I'd	: AEL/THC/270925/DN/02
M/s TPL-HCC BHIVPURI PSP JOINT VENTURE (Bhivpuri Pumped Storage Project)	Date	: 27.09.2025
Survey No-1, PO-Bhivpuri Camp I Taluka- Karjat I Dist-Raigad I Maharashtra - 410201		

SAMPLE PARTICULARS:	
Type of the Sample	DG Noise Level
Date of Sampling	23.09.2025
Name of Plant/Location	Batching Plant
Sample Collected By	Lab Rep.
Purpose of Analysis	Monitoring
Test Protocol	IS: 4758

TEST RESULTS:

Sr. No.	Location	Unit	Minimum	Maximum	Average	Insertion Loss	Limit as per CPCB
1	DG Set-500 KVA (Canopy door Open)	(dB)A	95.6	98.8	97.2	26.5	Minimum insertion loss should be 25 dB(A) or maximum 75 dB(A) at the outside of DG room and Sets
2	DG Set-500 KVA (Canopy door Closed)	(dB)A	69.1	72.3	70.7		

Remark:-Open & Close the Canopy of D.G Set, (0.5 meter Distance)

CPCB-Central Pollution Control Board.

*******End of Test Report*******

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Test Report

Report No.: AEL/THC/27092025/DN/03	Reporting Date:03/10/2025

Issued to:	Sample I'd : AEL/THC/270925/DN/03
M/s TPL-HCC BHIVPURI PSP JOINT VENTURE (Bhivpuri Pumped Storage Project)	Date : 27.09.2025
Survey No-1, PO-Bhivpuri Camp I Taluka- Karjat I Dist-Raigad I Maharashtra - 410201	

SAMPLE PARTICULARS:	
Type of the Sample	DG Noise Level
Date of Sampling	23.09.2025
Name of Plant/Location	Lower Reservoir
Sample Collected By	Lab Rep.
Purpose of Analysis	Monitoring
Test Protocol	IS: 4758

TEST RESULTS:

Sr. No.	Location	Unit	Minimum	Maximum	Average	Insertion Loss	Limit as per CPCB
1	DG Set-62.5 KVA (Canopy door Open)	(dB)A	95.2	98.1	96.6	26.7	Minimum insertion loss should be 25 dB(A) or maximum 75 dB(A) at the outside of DG room and Sets
2	DG Set-62.5 KVA (Canopy door Closed)	(dB)A	68.4	71.5	69.9		

Remark:-Open & Close the Canopy of D.G Set, (0.5 meter Distance)

CPCB-Central Pollution Control Board.

*******End of Test Report*******

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Test Report

Report No.: AEL/THC/27092025/DN/04	Reporting Date:03/10/2025

Issued to:	Sample I'd : AEL/THC/270925/DN/04
M/s TPL-HCC BHIVPURI PSP JOINT VENTURE (Bhivpuri Pumped Storage Project)	Date : 27.09.2025
Survey No-1, PO-Bhivpuri Camp I Taluka- Karjat I Dist-Raigad I Maharashtra - 410201	

SAMPLE PARTICULARS:	
Type of the Sample	DG Noise Level
Date of Sampling	23.09.2025
Name of Plant/Location	Power House
Sample Collected By	Lab Rep.
Purpose of Analysis	Monitoring
Test Protocol	IS: 4758

TEST RESULTS:

Sr. No.	Location	Unit	Minimum	Maximum	Average	Insertion Loss	Limit as per CPCB
1	DG Set-62.5 KVA (Canopy door Open)	(dB)A	94.6	97.5	96.1	26.7	Minimum insertion loss should be 25 dB(A) or maximum 75 dB(A) at the outside of DG room and Sets
2	DG Set-62.5 KVA (Canopy door Closed)	(dB)A	67.9	70.8	69.4		

Remark:-Open & Close the Canopy of D.G Set, (0.5 meter Distance)

CPCB-Central Pollution Control Board.

*******End of Test Report*******

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Job Description : Environmental Testing, ETP/STP Manufacturing, ETP/STP Plant Operation Pollution NOC Etc

Lab - H1-837, Near Pollution Control Board, RIICO Industrial Area, Bhiwadi, Distt. Khairthal-Tijara (Rajasthan)-301019

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Test Report

Report No.: AEL/THC/27092025/DN/05	Reporting Date:03/10/2025

Issued to:	Sample I'd : AEL/THC/270925/DN/05
M/s TPL-HCC BHIVPURI PSP JOINT VENTURE	**Date** : 27.09.2025
(Bhivpuri Pumped Storage Project)	
Survey No-1, PO-Bhivpuri Camp I Taluka- Karjat I Dist-Raigad I Maharashtra - 410201	

SAMPLE PARTICULARS:	
Type of the Sample	DG Noise Level
Date of Sampling	24.09.2025
Name of Plant/Location	Crusher Plant
Sample Collected By	Lab Rep.
Purpose of Analysis	Monitoring
Test Protocol	IS: 4758

TEST RESULTS:

Sr. No.	Location	Unit	Minimum	Maximum	Average	Insertion Loss	Limit as per CPCB
1	DG Set-5 KVA (Canopy door Open)	(dB)A	94.3	96.5	95.9	26.6	Minimum insertion loss should be 25 dB(A) or maximum 75 dB(A) at the outside of DG room and Sets
2	DG Set-5 KVA (Canopy door Closed)	(dB)A	67.8	70.7	69.3		

Remark:-Open & Close the Canopy of D.G Set, (0.5 meter Distance)

CPCB-Central Pollution Control Board.

*******End of Test Report*******

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Test Report

Report No.: AEL/THC/27092025/DN/06	Reporting Date:03/10/2025

Issued to:	Sample I'd : AEL/THC/270925/DN/06
M/s TPL-HCC BHIVPURI PSP JOINT VENTURE (Bhivpuri Pumped Storage Project)	Date : 27.09.2025
Survey No-1, PO-Bhivpuri Camp I Taluka- Karjat I Dist-Raigad I Maharashtra - 410201	

SAMPLE PARTICULARS:	
Type of the Sample	DG Noise Level
Date of Sampling	24.09.2025
Name of Plant/Location	Crusher Plant
Sample Collected By	Lab Rep.
Purpose of Analysis	Monitoring
Test Protocol	IS: 4758

TEST RESULTS:

Sr. No.	Location	Unit	Minimum	Maximum	Average	Insertion Loss	Limit as per CPCB
1	DG Set-40 KVA (Canopy door Open)	(dB)A	93.3	97.1	95.2	26.3	Minimum insertion loss should be 25 dB(A) or maximum 75 dB(A) at the outside of DG room and Sets
2	DG Set-40 KVA (Canopy door Closed)	(dB)A	67.0	70.8	68.9		

Remark:-Open & Close the Canopy of D.G Set, (0.5 meter Distance)

CPCB-Central Pollution Control Board.

*******End of Test Report*******

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ASIA ENVIRO LAB INDIA PVT. LTD.

(An ISO 9001:2015, 14001:2015, 45001:2018, CPCB & NABL Recognised Lab)

Job Description : Environmental Testing, ETP/STP Manufacturing, ETP/STP Plant Operation Pollution NOC Etc.

Lab - H1-837, Near Pollution Control Board, RIICO Industrial Area, Bhiwadi, Distt. Khairthal-Tijara (Rajasthan)-301019

Ph. No. : 09694666022, Email : asiaenvirolab@gmail.com, Website : www.asiaenvirolab.com

Test Report

Report No.: AEL/THC/27092025/DN/07	Reporting Date:03/10/2025

Issued to:	Sample I'd : AEL/THC/270925/DN/07
M/s TPL-HCC BHIVPURI PSP JOINT VENTURE (Bhivpuri Pumped Storage Project)	Date : 27.09.2025
Survey No-1, PO-Bhivpuri Camp I Taluka- Karjat I Dist-Raigad I Maharashtra - 410201	

SAMPLE PARTICULARS:	
Type of the Sample	DG Noise Level
Date of Sampling	24.09.2025
Name of Plant/Location	Dumping Plant
Sample Collected By	Lab Rep.
Purpose of Analysis	Monitoring
Test Protocol	IS: 4758

TEST RESULTS:

Sr. No.	Location	Unit	Minimum	Maximum	Average	Insertion Loss	Limit as per CPCB
1	DG Set-5 KVA (Canopy door Open)	(dB)A	92.5	95.6	94.1	25.9	Minimum insertion loss should be 25 dB(A) or maximum 75 dB(A) at the outside of DG room and Sets
2	DG Set-5 KVA (Canopy door Closed)	(dB)A	66.8	69.7	68.2		

Remark:-Open & Close the Canopy of D.G Set, (0.5 meter Distance)

CPCB-Central Pollution Control Board.

*******End of Test Report*******

Checked By

Authorized Signatory

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Ph. No. : 09694666022, Email : asiaenvirolab@gmail.com, Website : www.asiaenvirolab.com

Test Report

Report No.: AEL/THC/27092025/DN/08	Reporting Date:03/10/2025

Issued to:	Sample I'd : AEL/THC/270925/DN/08
M/s TPL-HCC BHIVPURI PSP JOINT VENTURE (Bhivpuri Pumped Storage Project)	Date : 27.09.2025
Survey No-1, PO-Bhivpuri Camp I Taluka- Karjat I Dist-Raigad I Maharashtra - 410201	

SAMPLE PARTICULARS:	
Type of the Sample	DG Noise Level
Date of Sampling	24.09.2025
Name of Plant/Location	Near Batching Plant
Sample Collected By	Lab Rep.
Purpose of Analysis	Monitoring
Test Protocol	IS: 4758

TEST RESULTS:

Sr. No.	Location	Unit	Minimum	Maximum	Average	Insertion Loss	Limit as per CPCB
1	DG Set-7.5 KVA (Canopy door Open)	(dB)A	96.4	99.9	98.2	27.4	Minimum insertion loss should be 25 dB(A) or maximum 75 dB(A) at the outside of DG room and Sets
2	DG Set-7.5 KVA (Canopy door Closed)	(dB)A	69.1	72.5	70.8		

Remark:-Open & Close the Canopy of D.G Set, (0.5 meter Distance)

CPCB-Central Pollution Control Board.

*******End of Test Report*******

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Lab - H1-837, Near Pollution Control Board, RIICO Industrial Area, Bhiwadi, Distt. Khairthal-Tijara (Rajasthan)-301019

Ph. No. : 09694666022, Email : aslaenvirolab@gmail.com, Website : www.aslaenvirolab.com

Test Report

Report No.: AEL/THC/27092025/DN/09	Reporting Date:03/10/2025

Issued to:	Sample I'd : AEL/THC/270925/DN/09
M/s TPL-HCC BHIVPURI PSP JOINT VENTURE	**Date** : 27.09.2025
(Bhivpuri Pumped Storage Project)	
Survey No-1, PO-Bhivpuri Camp I Taluka- Karjat I Dist-Raigad I Maharashtra - 410201	

SAMPLE PARTICULARS:	
Type of the Sample	DG Noise Level
Date of Sampling	24.09.2025
Name of Plant/Location	Office Back Side
Sample Collected By	Lab Rep.
Purpose of Analysis	Monitoring
Test Protocol	IS: 4758

TEST RESULTS:

Sr. No.	Location	Unit	Minimum	Maximum	Average	Insertion Loss	Limit as per CPCB
1	DG Set-35 KVA (Canopy door Open)	(dB)A	95.7	98.9	97.3	26.1	Minimum insertion loss should be 25 dB(A) or maximum 75 dB(A) at the outside of DG room and Sets
2	DG Set-35 KVA (Canopy door Closed)	(dB)A	69.6	72.8	71.2		

Remark:-Open & Close the Canopy of D.G Set, (0.5 meter Distance)

CPCB-Central Pollution Control Board.

*******End of Test Report*******

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Authorized Signatory

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Job Description : Environmental Testing, ETP/STP Manufacturing, ETP/STP Plant Operation Pollution NOC Etc.

Lab - H1-837, Near Pollution Control Board, RIICO Industrial Area, Bhiwadi, Distt. Khairthal-Tijara (Rajasthan)-301019

Ph. No. : 09694666022, Email : asiaenvirolab@gmail.com, Website : www.asiaenvirolab.com

Test Report

Report No.: AEL/THC/27092025/DN/10	Reporting Date:03/10/2025

Issued to:	Sample I'd : AEL/THC/270925/DN/10
M/s TPL-HCC BHIVPURI PSP JOINT VENTURE	**Date** : 27.09.2025
(Bhivpuri Pumped Storage Project)	
Survey No-1, PO-Bhivpuri Camp I Taluka- Karjat I Dist-Raigad I Maharashtra - 410201	

SAMPLE PARTICULARS:	
Type of the Sample	DG Noise Level
Date of Sampling	26.09.2025
Name of Plant/Location	Shanti Forest Area
Sample Collected By	Lab Rep.
Purpose of Analysis	Monitoring
Test Protocol	IS: 4758

TEST RESULTS:

Sr. No.	Location	Unit	Minimum	Maximum	Average	Insertion Loss	Limit as per CPCB
1	DG Set-40 KVA (Canopy door Open)	(dB)A	93.4	96.2	94.8	25.4	Minimum insertion loss should be 25 dB(A) or maximum 75 dB(A) at the outside of DG room and Sets
2	DG Set-40 KVA (Canopy door Closed)	(dB)A	68.0	70.8	69.4		

Remark:-Open & Close the Canopy of D.G Set, (0.5 meter Distance)

CPCB-Central Pollution Control Board.

*******End of Test Report*******

Checked By

Authorized Signatory

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Lab - H1-837, Near Pollution Control Board, RIICO Industrial Area, Bhiwadi, Distt. Khairthal-Tijara (Rajasthan)-301019

Ph. No. : 09694666022, Email : asiaenvirolab@gmail.com, Website : www.asiaenvirolab.com

Test Report

Report No.: AEL/THC/27092025/W/01	Reporting Date:03/10/2025

Issued to:	
M/s TPL-HCC BHIVPURI PSP JOINT VENTURE (Bhivpuri Pumped Storage Project)	**Sample I'd** : AEL/THC/270925/W/01
Survey No-1, PO-Bhivpuri Camp I Taluka- Karjat I Dist-Raigad I Maharashtra - 410201	**Date** : 27.09.2025
	Period of testing : 27.09.2025 to 03.10.2025

SAMPLE PARTICULARS:	
Type of the Sample	Drinking Water Sample
Date of Sampling	26.09.2025
Point of Sample Collection	From Tap (Office Block Upper Reservoir)
Sample Collected By	Customer
Purpose of Analysis	Monitoring

TEST RESULTS:

Sr. No.	Parameters	Unit	Results	Drinking Water Specifications (As per IS-10500)		Test Protocol
				Desirable Limits	Permissible Limits in the absence of better alternate source	
1	Colour	Hazen	<5	5 max.	15 max.	APHA 24th Ed.,2120 B
2	Odour	--	Agreeable	Agreeable	Agreeable	IS-3025(P-5)
3	Taste	--	Agreeable	Agreeable	Agreeable	IS-3025(P-8)
4	Turbidity	NTU	<0.1	1 max.	5 max	APHA 24th Ed.,2130 B
5	pH	--	7.92	6.5 – 8.5	No relaxation	APHA 24th Ed.,4500 H B
6	Total Hardness,(as $CaCO_3$)	mg/l	19.3	200 max.	600 max.	APHA 24th Ed.,2340 C
7	Iron,(as Fe)	mg/l	<0.02	1.0 max.	No relaxation.	APHA 24th Ed. P-3111,A,B,C
8	Chloride,(as Cl)	mg/l	5.8	250 max.	1000 max.	APHA 24th Ed.,4500 ClB
9	Residual Free Chlorine	mg/l	<0.1	0.20 max.	1 max	APHA 24th Ed.,4500 Cl
10	Calcium (as Ca)	mg/l	2.2	75 max.	200 max.	APHA 24th Ed.,3500 CaA
11	Magnesium,(as Mg)	mg/l	3.3	30 max.	100 max.	APHA 24th Ed.,3500 Mg B
12	Total Dissolved Solids	mg/l	42.0	500 max.	2000 max.	APHA 24th Ed.,2540 C
13	Sulphate,(as SO_4)	mg/l	2.8	200 max.	400 max.	APHA 24th Ed.,4500 SO4 E
14	Fluoride,(as F)	mg/l	<0.1	1.0 max.	1.5 max.	APHA 24th Ed.,4500
15	Total Alkalinity,(as $CaCO_3$)	mg/l	17.5	200 max.	600 max.	APHA 24th Ed.,2320 A
16	Chromium Total,(as Cr)	mg/l	<0.02	0.05 max.	No relaxation	APHA 24th Ed. P-3111,A,B,C
17	Mercury, (as Hg)	mg/l	N.D.	0.001 max	No relaxation	APHA 24th Ed. P-3111,A,B,C
18	Nitrate,(as NO_3)	mg/l	<0.2	45 max.	No relaxation	IS-3025(P-34)

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Report No.: AEL/THC/27092025/W/01				Reporting Date:03/10/2025		
19	Zinc,(as Zn)	mg/l	<0.02	5 max.	15 max.	APHA 24th Ed. P-3111,A,B,C
20	Phenolic Compounds, (as C_6H_5OH)	mg/l	<0.001	0.001 max.	0.002 max.	APHA 24th Ed. P- 5530 C
21	Copper,(as Cu)	mg/l	<0.02	0.05 max.	1.50 max.	APHA 24th Ed. P-3111,A,B,C
22	Manganese,(as Mn)	mg/l	<0.02	0.10 max.	0.30 max.	APHA 24th Ed. P-3111,A,B,C
23	Chloramines(as Cl_2)	mg/l	<0.1	4.0 max.	No relaxation	IS 3025 (P-26)-2021
24	Aluminum, (as Al)	mg/l	<0.01	0.03 max.	0.20 max.	APHA 24th Ed. P-3111,A,B,C
25	Cyanide ,(as CN)	mg/l	N.D.	0.05 max.	No relaxation	APHA 24th Ed. P- 4500 CN
26	Lead,(as Pb)	mg/l	<0.01	0.01 max.	No relaxation	APHA 24th Ed. P-3111,A,B,C
27	Cadmium, (as Cd)	mg/l	N.D.	0.003 max.	No relaxation	APHA 24th Ed. P-3111,A,B,C
28	Molybdenum (as Mo)	mg/l	< 0.01	0.07 max.	No relaxation	APHA 24th Ed. P-3111,A,B,C
29	Boron, (as B)	mg/l	<0.2	0.5 max	1.0 max	APHA 24th Ed.,4500 B C
30	Silver (as Ag)	mg/l	< 0.02	0.1 max.	No relaxation	APHA 24th Ed. P-3111,A,B,C
31	Selenium,(as Se)	mg/l	<0.01	0.01 max	No relaxation	APHA 24th Ed. P-3111,A,B,C
32	Anionic detergents (as MBAS)	mg/l	<0.1	0.2 max	1.0 max	IS 3025(P-68)-2019
33	Sulphide (as H_2S)	mg/l	N.D.	0.05 max	No relaxation	APHA 24th Ed.,4500S^2
34	Ammonia (as total ammonia-N)	mg/l	<0.1	0.5 max	No relaxation	IS-3025(P-34)
35	Cobalt	mg/l	<0.02	--	--	APHA 24th Ed.,3111 A B C
36	Barium (as Ba)	mg/l	<0.01	0.7 max.	No relaxation	APHA 24th Ed.,3111 A B C
37	Nickel (as Ni)	mg/l	<0.02	0.02 max.	No relaxation	APHA 24th Ed.,3111 A B C
Bacteriological Test Results						
38	Coli form organisms/100 ml	--	Absent	Shall not be detectable in any 100 ml sample		IS-15185:2016
39	E-Coli/ 100 ml	--	Absent	Shall not be detectable in any 100 ml sample		IS-15185:2016
40	Faecal-Coli/ 100 ml	--	Absent	Shall not be detectable in any 100 ml sample		IS-1622:1981

Remarks- N.D- Not Detectable

*******End of Test Report*******

Checked By

Authorized Signatory

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Ph. No. : 09694666022, Email : asiaenvirolab@gmail.com, Website : www.asiaenvirolab.com

Test Report

Report No.: AEL/THC/27092025/W/02	Reporting Date:03/10/2025

Issued to:	
M/s TPL-HCC BHIVPURI PSP JOINT VENTURE (Bhivpuri Pumped Storage Project)	**Sample I'd** : AEL/THC/270925/W/02
Survey No-1, PO-Bhivpuri Camp I Taluka- Karjat I Dist-Raigad I Maharashtra - 410201	**Date** : 27.09.2025
	Period of testing : 27.09.2025 to 03.10.2025

SAMPLE PARTICULARS:	
Type of the Sample	Drinking Water Sample
Date of Sampling	26.09.2025
Point of Sample Collection	From Tap (Guest House)
Sample Collected By	Customer
Purpose of Analysis	Monitoring

TEST RESULTS:

Sr. No.	Parameters	Unit	Results	Drinking Water Specifications (As per IS-10500)		Test Protocol
				Desirable Limits	Permissible Limits in the absence of better alternate source	
1	Colour	Hazen	<5	5 max.	15 max.	APHA 24th Ed.,2120 B
2	Odour	--	Agreeable	Agreeable	Agreeable	IS-3025(P-5)
3	Taste	--	Agreeable	Agreeable	Agreeable	IS-3025(P-8)
4	Turbidity	NTU	<0.1	1 max.	5 max	APHA 24th Ed.,2130 B
5	pH	--	6.40	6.5 – 8.5	No relaxation	APHA 24th Ed.,4500 H B
6	Total Hardness,(as $CaCO_3$)	mg/l	<1.0	200 max.	600 max.	APHA 24th Ed.,2340 C
7	Iron,(as Fe)	mg/l	<0.02	1.0 max.	No relaxation.	APHA 24th Ed. P-3111,A,B,C
8	Chloride,(as Cl)	mg/l	8.8	250 max.	1000 max.	APHA 24th Ed.,4500 ClB
9	Residual Free Chlorine	mg/l	<0.1	0.20 max.	1 max	APHA 24th Ed.,4500 Cl
10	Calcium (as Ca)	mg/l	<1.0	75 max.	200 max.	APHA 24th Ed.,3500 CaA
11	Magnesium,(as Mg)	mg/l	<1.0	30 max.	100 max.	APHA 24th Ed.,3500 Mg B
12	Total Dissolved Solids	mg/l	18.0	500 max.	2000 max.	APHA 24th Ed.,2540 C
13	Sulphate,(as SO_4)	mg/l	<1.0	200 max.	400 max.	APHA 24th Ed.,4500 SO4 E
14	Fluoride,(as F)	mg/l	<0.1	1.0 max.	1.5 max.	APHA 24th Ed.,4500
15	Total Alkalinity,(as $CaCO_3$)	mg/l	10.5	200 max.	600 max.	APHA 24th Ed.,2320 A
16	Chromium Total,(as Cr)	mg/l	<0.02	0.05 max.	No relaxation	APHA 24th Ed. P-3111,A,B,C
17	Mercury, (as Hg)	mg/l	N.D.	0.001 max	No relaxation	APHA 24th Ed. P-3111,A,B,C
18	Nitrate,(as NO_3)	mg/l	<0.2	45 max.	No relaxation	IS-3025(P-34)

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Job Description : Environmental Testing, ETP/STP Manufacturing, ETP/STP Plant Operation Pollution NOC Etc

Lab - H1-837, Near Pollution Control Board, RIICO Industrial Area, Bhiwadi, Distt. Khairthal-Tijara (Rajasthan)-301019

Ph. No. : 09694666022, Email : asiaenvirolab@gmail.com, Website : www.asiaenvirolab.com

Report No.: AEL/THC/27092025/W/02					Reporting Date:03/10/2025	
19	Zinc,(as Zn)	mg/l	<0.02	5 max.	15 max.	APHA 24th Ed. P-3111,A,B,C
20	Phenolic Compounds, (as C_6H_5OH)	mg/l	<0.001	0.001 max.	0.002 max.	APHA 24th Ed. P- 5530 C
21	Copper,(as Cu)	mg/l	<0.02	0.05 max.	1.50 max.	APHA 24th Ed. P-3111,A,B,C
22	Manganese,(as Mn)	mg/l	<0.02	0.10 max.	0.30 max.	APHA 24th Ed. P-3111,A,B,C
23	Chloramines(as Cl_2)	mg/l	<0.1	4.0 max.	No relaxation	IS 3025 (P-26)-2021
24	Aluminum, (as Al)	mg/l	<0.01	0.03 max.	0.20 max.	APHA 24th Ed. P-3111,A,B,C
25	Cyanide ,(as CN)	mg/l	N.D.	0.05 max.	No relaxation	APHA 24th Ed. P- 4500 CN
26	Lead,(as Pb)	mg/l	<0.01	0.01 max.	No relaxation	APHA 24th Ed. P-3111,A,B,C
27	Cadmium, (as Cd)	mg/l	N.D.	0.003 max.	No relaxation	APHA 24th Ed. P-3111,A,B,C
28	Molybdenum (as Mo)	mg/l	< 0.01	0.07 max.	No relaxation	APHA 24th Ed. P-3111,A,B,C
29	Boron, (as B)	mg/l	<0.2	0.5 max	1.0 max	APHA 24th Ed.,4500 B C
30	Silver (as Ag)	mg/l	< 0.02	0.1 max.	No relaxation	APHA 24th Ed. P-3111,A,B,C
31	Selenium,(as Se)	mg/l	<0.01	0.01 max	No relaxation	APHA 24th Ed. P-3111,A,B,C
32	Anionic detergents (as MBAS)	mg/l	<0.1	0.2 max	1.0 max	IS 3025(P-68)-2019
33	Sulphide (as H_2S)	mg/l	N.D.	0.05 max	No relaxation	APHA 24th Ed.,4500S^2
34	Ammonia (as total ammonia-N)	mg/l	<0.1	0.5 max	No relaxation	IS-3025(P-34)
35	Cobalt	mg/l	<0.02	--	--	APHA 24th Ed.,3111 A B C
36	Barium (as Ba)	mg/l	<0.01	0.7 max.	No relaxation	APHA 24th Ed.,3111 A B C
37	Nickel (as Ni)	mg/l	<0.02	0.02 max.	No relaxation	APHA 24th Ed.,3111 A B C
Bacteriological Test Results						
38	Coli form organisms/100 ml	--	Absent	Shall not be detectable in any 100 ml sample		IS-15185:2016
39	E-Coli/ 100 ml	--	Absent	Shall not be detectable in any 100 ml sample		IS-15185:2016
40	Faecal-Coli/ 100 ml	--	Absent	Shall not be detectable in any 100 ml sample		IS-1622:1981

Remarks- N.D- Not Detectable

*******End of Test Report*******

Checked By

Authorized Signatory

Note: 1. The result listed refer only to the tested samples and applicable parameters.
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Job Description : Environmental Testing, ETP/STP Manufacturing, ETP/STP Plant Operation Pollution NOC Etc

Lab - H1-837, Near Pollution Control Board, RIICO Industrial Area, Bhiwadi, Distt. Khairthal-Tijara (Rajasthan)-301019

Ph. No. : 09694666022, Email : aslaenvirolab@gmail.com, Website : www.asiaenvirolab.com

Test Report

Report No.: AEL/THC/27092025/W/03	Reporting Date:03/10/2025

Issued to:	Sample I'd : AEL/THC/270925/W/03 Date : 27.09.2025 Period of testing : 27.09.2025 to 03.10.2025
M/s TPL-HCC BHIVPURI PSP JOINT VENTURE **(Bhivpuri Pumped Storage Project)** Survey No-1, PO-Bhivpuri Camp I Taluka- Karjat I Dist-Raigad I Maharashtra - 410201	

SAMPLE PARTICULARS:	
Type of the Sample	Drinking Water Sample
Date of Sampling	26.09.2025
Point of Sample Collection	From Tap (Tata Power Plant Main Gate)
Sample Collected By	Customer
Purpose of Analysis	Monitoring

TEST RESULTS:

Sr. No.	Parameters	Unit	Results	Drinking Water Specifications (As per IS-10500)		Test Protocol
				Desirable Limits	Permissible Limits in the absence of better alternate source	
1	Colour	Hazen	<5	5 max.	15 max.	APHA 24th Ed.,2120 B
2	Odour	--	Agreeable	Agreeable	Agreeable	IS-3025(P-5)
3	Taste	--	Agreeable	Agreeable	Agreeable	IS-3025(P-8)
4	Turbidity	NTU	<0.1	1 max.	5 max	APHA 24th Ed.,2130 B
5	pH	--	7.35	6.5 – 8.5	No relaxation	APHA 24th Ed.,4500 H B
6	Total Hardness,(as $CaCO_3$)	mg/l	30.3	200 max.	600 max.	APHA 24th Ed.,2340 C
7	Iron,(as Fe)	mg/l	<0.02	1.0 max.	No relaxation.	APHA 24th Ed. P-3111,A,B,C
8	Chloride,(as Cl)	mg/l	7.8	250 max.	1000 max.	APHA 24th Ed.,4500 ClB
9	Residual Free Chlorine	mg/l	<0.1	0.20 max.	1 max	APHA 24th Ed.,4500 Cl
10	Calcium (as Ca)	mg/l	6.6	75 max.	200 max.	APHA 24th Ed.,3500 CaA
11	Magnesium,(as Mg)	mg/l	3.3	30 max.	100 max.	APHA 24th Ed.,3500 Mg B
12	Total Dissolved Solids	mg/l	53.0	500 max.	2000 max.	APHA 24th Ed.,2540 C
13	Sulphate,(as SO_4)	mg/l	3.5	200 max.	400 max.	APHA 24th Ed.,4500 SO4 E
14	Fluoride,(as F)	mg/l	<0.1	1.0 max.	1.5 max.	APHA 24th Ed.,4500
15	Total Alkalinity,(as $CaCO_3$)	mg/l	22.8	200 max.	600 max.	APHA 24th Ed.,2320 A
16	Chromium Total,(as Cr)	mg/l	<0.02	0.05 max.	No relaxation	APHA 24th Ed. P-3111,A,B,C
17	Mercury, (as Hg)	mg/l	N.D.	0.001 max	No relaxation	APHA 24th Ed. P-3111,A,B,C
18	Nitrate,(as NO_3)	mg/l	1.35	45 max.	No relaxation	IS-3025(P-34)

Note: 1. The result listed refer only to the tested samples and applicable parameters.
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ASIA ENVIRO LAB INDIA PVT. LTD.

(An ISO 9001:2015, 14001:2015, 45001:2018, CPCB & NABL Recognised Lab)

Job Description : Environmental Testing, ETP/STP Manufacturing, ETP/STP Plant Operation Pollution NOC Etc.

Lab - H1-837, Near Pollution Control Board, RIICO Industrial Area, Bhiwadi, Distt. Khairthal-Tijara (Rajasthan)-301019

Ph. No. : 09694666022, Email : asiaenvirolab@gmail.com, Website : www.asiaenvirolab.com

Report No.: AEL/THC/27092025/W/03				Reporting Date:03/10/2025		
19	Zinc,(as Zn)	mg/l	<0.02	5 max.	15 max.	APHA 24th Ed. P-3111,A,B,C
20	Phenolic Compounds, (as C_6H_5OH)	mg/l	<0.001	0.001 max.	0.002 max.	APHA 24th Ed. P- 5530 C
21	Copper,(as Cu)	mg/l	<0.02	0.05 max.	1.50 max.	APHA 24th Ed. P-3111,A,B,C
22	Manganese,(as Mn)	mg/l	<0.02	0.10 max.	0.30 max.	APHA 24th Ed. P-3111,A,B,C
23	Chloramines(as Cl_2)	mg/l	<0.1	4.0 max.	No relaxation	IS 3025 (P-26)-2021
24	Aluminum, (as Al)	mg/l	<0.01	0.03 max.	0.20 max.	APHA 24th Ed. P-3111,A,B,C
25	Cyanide ,(as CN)	mg/l	N.D.	0.05 max.	No relaxation	APHA 24th Ed. P- 4500 CN
26	Lead,(as Pb)	mg/l	<0.01	0.01 max.	No relaxation	APHA 24th Ed. P-3111,A,B,C
27	Cadmium, (as Cd)	mg/l	N.D.	0.003 max.	No relaxation	APHA 24th Ed. P-3111,A,B,C
28	Molybdenum (as Mo)	mg/l	< 0.01	0.07 max.	No relaxation	APHA 24th Ed. P-3111,A,B,C
29	Boron, (as B)	mg/l	<0.2	0.5 max	1.0 max	APHA 24th Ed.,4500 B C
30	Silver (as Ag)	mg/l	< 0.02	0.1 max.	No relaxation	APHA 24th Ed. P-3111,A,B,C
31	Selenium,(as Se)	mg/l	<0.01	0.01 max	No relaxation	APHA 24th Ed. P-3111,A,B,C
32	Anionic detergents (as MBAS)	mg/l	<0.1	0.2 max	1.0 max	IS 3025(P-68)-2019
33	Sulphide (as H_2S)	mg/l	N.D.	0.05 max	No relaxation	APHA 24th Ed.,4500S^2
34	Ammonia (as total ammonia-N)	mg/l	<0.1	0.5 max	No relaxation	IS-3025(P-34)
35	Cobalt	mg/l	<0.02	--	--	APHA 24th Ed.,3111 A B C
36	Barium (as Ba)	mg/l	<0.01	0.7 max.	No relaxation	APHA 24th Ed.,3111 A B C
37	Nickel (as Ni)	mg/l	<0.02	0.02 max.	No relaxation	APHA 24th Ed.,3111 A B C
Bacteriological Test Results						
38	Coli form organisms/100 ml	--	Absent	Shall not be detectable in any 100 ml sample		IS-15185:2016
39	E-Coli/ 100 ml	--	Absent	Shall not be detectable in any 100 ml sample		IS-15185:2016
40	Faecal-Coli/ 100 ml	--	Absent	Shall not be detectable in any 100 ml sample		IS-1622:1981

Remarks- N.D- Not Detectable

*******End of Test Report*******

Checked By

Authorized Signatory

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ASIA ENVIRO LAB INDIA PVT. LTD.

(An ISO 9001:2015, 14001:2015, 45001:2018, CPCB & NABL Recognised Lab)

Job Description : Environmental Testing, ETP/STP Manufacturing, ETP/STP Plant Operation Pollution NOC Etc.

Lab - H1-837, Near Pollution Control Board, RIICO Industrial Area, Bhiwadi, Distt. Khairthal-Tijara (Rajasthan)-301019

Ph. No. : 09694666022, Email : asiaenvirolab@gmail.com, Website : www.asiaenvirolab.com

Test Report

Report No.: AEL/THC/27092025/W/04	Reporting Date:03/10/2025

Issued to:	
M/s TPL-HCC BHIVPURI PSP JOINT VENTURE (Bhivpuri Pumped Storage Project) Survey No-1, PO-Bhivpuri Camp I Taluka- Karjat I Dist-Raigad I Maharashtra - 410201	**Sample I'd** : AEL/THC/270925/W/04 **Date** : 27.09.2025 **Period of testing** : 27.09.2025 to 03.10.2025

SAMPLE PARTICULARS:	
Type of the Sample	Drinking Water Sample
Date of Sampling	26.09.2025
Point of Sample Collection	From Tap (Shanti Forest Resort Office Block)
Sample Collected By	Customer
Purpose of Analysis	Monitoring

TEST RESULTS:

Sr. No.	Parameters	Unit	Results	Drinking Water Specifications (As per IS-10500)		Test Protocol
				Desirable Limits	Permissible Limits in the absence of better alternate source	
1	Colour	Hazen	<5	5 max.	15 max.	APHA 24th Ed.,2120 B
2	Odour	--	Agreeable	Agreeable	Agreeable	IS-3025(P-5)
3	Taste	--	Agreeable	Agreeable	Agreeable	IS-3025(P-8)
4	Turbidity	NTU	<0.1	1 max.	5 max	APHA 24th Ed.,2130 B
5	pH	--	6.77	6.5 – 8.5	No relaxation	APHA 24th Ed.,4500 H B
6	Total Hardness,(as $CaCO_3$)	mg/l	<1.0	200 max.	600 max.	APHA 24th Ed.,2340 C
7	Iron,(as Fe)	mg/l	<0.02	1.0 max.	No relaxation.	APHA 24th Ed. P-3111,A,B,C
8	Chloride,(as Cl)	mg/l	6.8	250 max.	1000 max.	APHA 24th Ed.,4500 ClB
9	Residual Free Chlorine	mg/l	<0.1	0.20 max.	1 max	APHA 24th Ed.,4500 Cl
10	Calcium (as Ca)	mg/l	<1.0	75 max.	200 max.	APHA 24th Ed.,3500 CaA
11	Magnesium,(as Mg)	mg/l	<1.0	30 max.	100 max.	APHA 24th Ed.,3500 Mg B
12	Total Dissolved Solids	mg/l	22.0	500 max.	2000 max.	APHA 24th Ed.,2540 C
13	Sulphate,(as SO_4)	mg/l	<1.0	200 max.	400 max.	APHA 24th Ed.,4500 SO4 E
14	Fluoride,(as F)	mg/l	<0.1	1.0 max.	1.5 max.	APHA 24th Ed.,4500
15	Total Alkalinity,(as $CaCO_3$)	mg/l	<1.0	200 max.	600 max.	APHA 24th Ed.,2320 A
16	Chromium Total,(as Cr)	mg/l	<0.02	0.05 max.	No relaxation	APHA 24th Ed. P-3111,A,B,C
17	Mercury, (as Hg)	mg/l	N.D.	0.001 max	No relaxation	APHA 24th Ed. P-3111,A,B,C
18	Nitrate,(as NO_3)	mg/l	<0.2	45 max.	No relaxation	IS-3025(P-34)

Note: 1. The result listed refer only to the tested samples and applicable parameters.
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ASIA ENVIRO LAB INDIA PVT. LTD.

(An ISO 9001:2015, 14001:2015, 45001:2018, CPCB & NABL Recognised Lab)

Job Description : Environmental Testing, ETP/STP Manufacturing, ETP/STP Plant Operation Pollution NOC Etc

Lab - H1-837, Near Pollution Control Board, RIICO Industrial Area, Bhiwadi, Distt. Khairthal-Tijara (Rajasthan)-301019

Ph. No. : 09694666022, Email : aslaenvirolab@gmail.com, Website : www.aslaenvirolab.com

Report No.: AEL/THC/27092025/W/04					Reporting Date:03/10/2025	
19	Zinc,(as Zn)	mg/l	<0.02	5 max.	15 max.	APHA 24th Ed. P-3111,A,B,C
20	Phenolic Compounds, (as C_6H_5OH)	mg/l	<0.001	0.001 max.	0.002 max.	APHA 24th Ed. P- 5530 C
21	Copper,(as Cu)	mg/l	<0.02	0.05 max.	1.50 max.	APHA 24th Ed. P-3111,A,B,C
22	Manganese,(as Mn)	mg/l	<0.02	0.10 max.	0.30 max.	APHA 24th Ed. P-3111,A,B,C
23	Chloramines(as Cl_2)	mg/l	<0.1	4.0 max.	No relaxation	IS 3025 (P-26)-2021
24	Aluminum, (as Al)	mg/l	<0.01	0.03 max.	0.20 max.	APHA 24th Ed. P-3111,A,B,C
25	Cyanide ,(as CN)	mg/l	N.D.	0.05 max.	No relaxation	APHA 24th Ed. P- 4500 CN
26	Lead,(as Pb)	mg/l	<0.01	0.01 max.	No relaxation	APHA 24th Ed. P-3111,A,B,C
27	Cadmium, (as Cd)	mg/l	N.D.	0.003 max.	No relaxation	APHA 24th Ed. P-3111,A,B,C
28	Molybdenum (as Mo)	mg/l	< 0.01	0.07 max.	No relaxation	APHA 24th Ed. P-3111,A,B,C
29	Boron, (as B)	mg/l	<0.2	0.5 max	1.0 max	APHA 24th Ed.,4500 B C
30	Silver (as Ag)	mg/l	< 0.02	0.1 max.	No relaxation	APHA 24th Ed. P-3111,A,B,C
31	Selenium,(as Se)	mg/l	<0.01	0.01 max	No relaxation	APHA 24th Ed. P-3111,A,B,C
32	Anionic detergents (as MBAS)	mg/l	<0.1	0.2 max	1.0 max	IS 3025(P-68)-2019
33	Sulphide (as H_2S)	mg/l	N.D.	0.05 max	No relaxation	APHA 24th Ed.,4500S^2
34	Ammonia (as total ammonia-N)	mg/l	<0.1	0.5 max	No relaxation	IS-3025(P-34)
35	Cobalt	mg/l	<0.02	--	--	APHA 24th Ed.,3111 A B C
36	Barium (as Ba)	mg/l	<0.01	0.7 max.	No relaxation	APHA 24th Ed.,3111 A B C
37	Nickel (as Ni)	mg/l	<0.02	0.02 max.	No relaxation	APHA 24th Ed.,3111 A B C
Bacteriological Test Results						
38	Coli form organisms/100 ml	--	Absent	Shall not be detectable in any 100 ml sample		IS-15185:2016
39	E-Coli/ 100 ml	--	Absent	Shall not be detectable in any 100 ml sample		IS-15185:2016
40	Faecal-Coli/ 100 ml	--	Absent	Shall not be detectable in any 100 ml sample		IS-1622:1981

Remarks- N.D- Not Detectable

*******End of Test Report*******

Checked By

Authorized Signatory

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ASIA ENVIRO LAB INDIA PVT. LTD.

(An ISO 9001:2015, 14001:2015, 45001:2018, CPCB & NABL Recognised Lab)

Job Description : Environmental Testing, ETP/STP Manufacturing, ETP/STP Plant Operation Pollution NOC Etc.

Lab - H1-837, Near Pollution Control Board, RIICO Industrial Area, Bhiwadi, Distt. Khairthal-Tijara (Rajasthan)-301019

Ph. No. : 09694686022, Email : aslaenvirolab@gmail.com, Website : www.aslaenvirolab.com

Test Report

Report No.: AEL/THC/27092025/W/05	Reporting Date:03/10/2025

Issued to:	
M/s TPL-HCC BHIVPURI PSP JOINT VENTURE (Bhivpuri Pumped Storage Project) Survey No-1, PO-Bhivpuri Camp I Taluka- Karjat I Dist-Raigad I Maharashtra - 410201	**Sample I'd** : AEL/THC/270925/W/05 **Date** : 27.09.2025 **Period of testing** : 27.09.2025 to 03.10.2025

SAMPLE PARTICULARS:	
Type of the Sample	Domestic Water Sample
Date of Sampling	26.09.2025
Point of Sample Collection	From Tap (Shanti Forest Resort Office Block)
Sample Collected By	Customer
Purpose of Analysis	Monitoring

TEST RESULTS:

Sr. No.	Parameters	Unit	Results	Drinking Water Specifications (As per IS-10500)		Test Protocol
				Desirable Limits	Permissible Limits in the absence of better alternate source	
1	Colour	Hazen	<5	5 max.	15 max.	APHA 24th Ed.,2120 B
2	Odour	--	Agreeable	Agreeable	Agreeable	IS-3025(P-5)
3	Turbidity	NTU	<0.1	1 max.	5 max	APHA 24th Ed.,2130 B
4	pH	--	7.56	6.5 – 8.5	No relaxation	APHA 24th Ed.,4500 H B
5	Total Hardness,(as $CaCO_3$)	mg/l	259.4	200 max.	600 max.	APHA 24th Ed.,2340 C
6	Iron,(as Fe)	mg/l	0.06	1.0 max.	No relaxation.	APHA 24th Ed. P-3111,A,B,C
7	Chloride,(as Cl)	mg/l	72.4	250 max.	1000 max.	APHA 24th Ed.,4500 ClB
8	Residual Free Chlorine	mg/l	<0.1	0.20 max.	1 max	APHA 24th Ed.,4500 Cl
9	Calcium (as Ca)	mg/l	50.7	75 max.	200 max.	APHA 24th Ed.,3500 CaA
10	Magnesium,(as Mg)	mg/l	31.5	30 max.	100 max.	APHA 24th Ed.,3500 Mg B
11	Total Dissolved Solids	mg/l	384.0	500 max.	2000 max.	APHA 24th Ed.,2540 C
12	Sulphate,(as SO_4)	mg/l	21.6	200 max.	400 max.	APHA 24th Ed.,4500 SO4 E
13	Fluoride,(as F)	mg/l	0.18	1.0 max.	1.5 max.	APHA 24th Ed.,4500
14	Total Alkalinity,(as $CaCO_3$)	mg/l	91.2	200 max.	600 max.	APHA 24th Ed.,2320 A
15	Chromium Total,(as Cr)	mg/l	<0.02	0.05 max.	No relaxation	APHA 24th Ed. P-3111,A,B,C
16	Mercury, (as Hg)	mg/l	N.D.	0.001 max	No relaxation	APHA 24th Ed. P-3111,A,B,C
17	Nitrate,(as NO_3)	mg/l	7.89	45 max.	No relaxation	IS-3025(P-34)
18	Zinc,(as Zn)	mg/l	<0.02	5 max.	15 max.	APHA 24th Ed. P-3111,A,B,C

Note: 1. The result listed refer only to the tested samples and applicable parameters.
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Lab - H1-837, Near Pollution Control Board, RIICO Industrial Area, Bhiwadi, Distt. Khairthal-Tijara (Rajasthan)-301019

Ph. No. : 09694666022, Email : asiaenvirolab@gmail.com, Website : www.asiaenvirolab.com

Report No.: AEL/THC/27092025/W/05					Reporting Date:03/10/2025	
19	Phenolic Compounds, (as C_6H_5OH)	mg/l	<0.001	0.001 max.	0.002 max.	APHA 24th Ed. P- 5530 C
20	Copper,(as Cu)	mg/l	<0.02	0.05 max.	1.50 max.	APHA 24th Ed. P-3111,A,B,C
21	Manganese,(as Mn)	mg/l	<0.02	0.10 max.	0.30 max.	APHA 24th Ed. P-3111,A,B,C
22	Cobalt	mg/l	<0.02	--	--	APHA 24th Ed.,3111 A B C
23	Aluminum, (as Al)	mg/l	<0.01	0.03 max.	0.20 max.	APHA 24th Ed. P-3111,A,B,C
24	Cyanide ,(as CN)	mg/l	N.D.	0.05 max.	No relaxation	APHA 24th Ed. P- 4500 CN
25	Lead,(as Pb)	mg/l	<0.01	0.01 max.	No relaxation	APHA 24th Ed. P-3111,A,B,C
26	Cadmium, (as Cd)	mg/l	N.D.	0.003 max.	No relaxation	APHA 24th Ed. P-3111,A,B,C
27	Molybdenum (as Mo)	mg/l	< 0.01	0.07 max.	No relaxation	APHA 24th Ed. P-3111,A,B,C
28	Boron, (as B)	mg/l	<0.2	0.5 max	1.0 max	APHA 24th Ed.,4500 B C
29	Silver (as Ag)	mg/l	< 0.02	0.1 max.	No relaxation	APHA 24th Ed. P-3111,A,B,C
30	Selenium,(as Se)	mg/l	<0.01	0.01 max	No relaxation	APHA 24th Ed. P-3111,A,B,C
31	Anionic detergents (as MBAS)	mg/l	<0.1	0.2 max	1.0 max	IS 3025(P-68)-2019
32	Sulphide (as H_2S)	mg/l	N.D.	0.05 max	No relaxation	APHA 24th Ed.,4500S^2
33	Ammonia (as total ammonia-N)	mg/l	<0.1	0.5 max	No relaxation	IS-3025(P-34)
34	Chloramines (as CL_2)	mg/l	<0.1	4.0	No Relaxation	IS 3025 (P-26)-2021
35	Barium (as Ba)	mg/l	<0.01	0.7 max.	No relaxation	APHA 24th Ed.,3111 A B C
36	Nickel (as Ni)	mg/l	<0.02	0.02 max.	No relaxation	APHA 24th Ed.,3111 A B C
37	Vanadium	mg/l	<0.01	--	--	APHA 24th Ed.,3111 A B C
Bacteriological Test Results						
38	Coli form organisms/100 ml	--	Absent	Shall not be detectable in any 100 ml sample		IS-15185:2016
39	E-Coli/ 100 ml	--	Absent	Shall not be detectable in any 100 ml sample		IS-15185:2016
40	Faecal-Coli/ 100 ml	--	Absent	Shall not be detectable in any 100 ml sample		IS-1622:1981

Remarks- N.D- Not Detectable

*******End of Test Report*******

Checked By

Authorized Signatory

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Lab - H1-837, Near Pollution Control Board, RIICO Industrial Area, Bhiwadi, Distt. Khairthal-Tijara (Rajasthan)-301019

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Test Report

Report No.: AEL/THC/27092025/W/06	Reporting Date:03/10/2025

Issued to:	
M/s TPL-HCC BHIVPURI PSP JOINT VENTURE (Bhivpuri Pumped Storage Project)	**Sample I'd** : AEL/THC/270925/W/06
Survey No-1, PO-Bhivpuri Camp I Taluka- Karjat I Dist-Raigad I Maharashtra - 410201	**Date** : 27.09.2025
	Period of testing : 27.09.2025 to 03.10.2025

SAMPLE PARTICULARS:	
Type of the Sample	Canal Inlet Water Sample
Date of Sampling	26.09.2025
Point of Sample Collection	From Tap (Tata Power Plant Office Area)
Sample Collected By	Customer
Purpose of Analysis	Monitoring

TEST RESULTS:

Sr. No.	Parameters	Unit	Results	Drinking Water Specifications (As per IS-10500)		Test Protocol
				Desirable Limits	Permissible Limits in the absence of better alternate source	
1	Colour	Hazen	<5	5 max.	15 max.	APHA 24th Ed.,2120 B
2	Odour	--	Agreeable	Agreeable	Agreeable	IS-3025(P-5)
3	Turbidity	NTU	<0.1	1 max.	5 max	APHA 24th Ed.,2130 B
4	pH	--	7.21	6.5 – 8.5	No relaxation	APHA 24th Ed.,4500 H B
5	Total Hardness,(as $CaCO_3$)	mg/l	33.1	200 max.	600 max.	APHA 24th Ed.,2340 C
6	Iron,(as Fe)	mg/l	<0.02	1.0 max.	No relaxation.	APHA 24th Ed. P-3111,A,B,C
7	Chloride,(as Cl)	mg/l	9.7	250 max.	1000 max.	APHA 24th Ed.,4500 ClB
8	Residual Free Chlorine	mg/l	<0.1	0.20 max.	1 max	APHA 24th Ed.,4500 Cl
9	Calcium (as Ca)	mg/l	6.6	75 max.	200 max.	APHA 24th Ed.,3500 CaA
10	Magnesium,(as Mg)	mg/l	4.0	30 max.	100 max.	APHA 24th Ed.,3500 Mg B
11	Total Dissolved Solids	mg/l	68.0	500 max.	2000 max.	APHA 24th Ed.,2540 C
12	Sulphate,(as SO_4)	mg/l	3.7	200 max.	400 max.	APHA 24th Ed.,4500 SO4 E
13	Fluoride,(as F)	mg/l	<0.1	1.0 max.	1.5 max.	APHA 24th Ed.,4500
14	Total Alkalinity,(as $CaCO_3$)	mg/l	28.0	200 max.	600 max.	APHA 24th Ed.,2320 A
15	Chromium Total,(as Cr)	mg/l	<0.02	0.05 max.	No relaxation	APHA 24th Ed. P-3111,A,B,C
16	Mercury, (as Hg)	mg/l	N.D.	0.001 max	No relaxation	APHA 24th Ed. P-3111,A,B,C
17	Nitrate,(as NO_3)	mg/l	1.96	45 max.	No relaxation	IS-3025(P-34)
18	Zinc,(as Zn)	mg/l	<0.02	5 max.	15 max.	APHA 24th Ed. P-3111,A,B,C

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ASIA ENVIRO LAB INDIA PVT. LTD.

(An ISO 9001:2015, 14001:2015, 45001:2018, CPCB & NABL Recognised Lab)

Job Description : Environmental Testing, ETP/STP Manufacturing, ETP/STP Plant Operation Pollution NOC Etc.

Lab - H1-837, Near Pollution Control Board, RIICO Industrial Area, Bhiwadi, Distt. Khairthal-Tijara (Rajasthan)-301019

Ph. No. : 09694666022, Email : asiaenvirolab@gmail.com, Website : www.asiaenvirolab.com

Report No.: AEL/THC/27092025/W/06					Reporting Date:03/10/2025	
19	Phenolic Compounds, (as C_6H_5OH)	mg/l	<0.001	0.001 max.	0.002 max.	APHA 24th Ed. P- 5530 C
20	Copper,(as Cu)	mg/l	<0.02	0.05 max.	1.50 max.	APHA 24th Ed. P-3111,A,B,C
21	Manganese,(as Mn)	mg/l	<0.02	0.10 max.	0.30 max.	APHA 24th Ed. P-3111,A,B,C
22	Cobalt	mg/l	<0.02	--	--	APHA 24th Ed.,3111 A B C
23	Aluminum, (as Al)	mg/l	<0.01	0.03 max.	0.20 max.	APHA 24th Ed. P-3111,A,B,C
24	Cyanide ,(as CN)	mg/l	N.D.	0.05 max.	No relaxation	APHA 24th Ed. P- 4500 CN
25	Lead,(as Pb)	mg/l	<0.01	0.01 max.	No relaxation	APHA 24th Ed. P-3111,A,B,C
26	Cadmium, (as Cd)	mg/l	N.D.	0.003 max.	No relaxation	APHA 24th Ed. P-3111,A,B,C
27	Molybdenum (as Mo)	mg/l	< 0.01	0.07 max.	No relaxation	APHA 24th Ed. P-3111,A,B,C
28	Boron, (as B)	mg/l	<0.2	0.5 max	1.0 max	APHA 24th Ed.,4500 B C
29	Silver (as Ag)	mg/l	< 0.02	0.1 max.	No relaxation	APHA 24th Ed. P-3111,A,B,C
30	Selenium,(as Se)	mg/l	<0.01	0.01 max	No relaxation	APHA 24th Ed. P-3111,A,B,C
31	Anionic detergents (as MBAS)	mg/l	<0.1	0.2 max	1.0 max	IS 3025(P-68)-2019
32	Sulphide (as H_2S)	mg/l	N.D.	0.05 max	No relaxation	APHA 24th Ed.,4500S^2
33	Ammonia (as total ammonia-N)	mg/l	<0.1	0.5 max	No relaxation	IS-3025(P-34)
34	Chloramines (as CL_2)	mg/l	<0.1	4.0	No Relaxation	IS 3025 (P-26)-2021
35	Barium (as Ba)	mg/l	<0.01	0.7 max.	No relaxation	APHA 24th Ed.,3111 A B C
36	Nickel (as Ni)	mg/l	<0.02	0.02 max.	No relaxation	APHA 24th Ed.,3111 A B C
37	Vanadium	mg/l	<0.01	--	--	APHA 24th Ed.,3111 A B C
Bacteriological Test Results						
38	Coli form organisms/100 ml	--	Absent	Shall not be detectable in any 100 ml sample		IS-15185:2016
39	E-Coli/ 100 ml	--	Absent	Shall not be detectable in any 100 ml sample		IS-15185:2016
40	Faecal-Coli/ 100 ml	--	Absent	Shall not be detectable in any 100 ml sample		IS-1622:1981

Remarks- N.D- Not Detectable

*******End of Test Report*******

Checked By

Authorized Signatory

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Job Description : Environmental Testing, ETP/STP Manufacturing, ETP/STP Plant Operation Pollution NOC Etc.

Lab - H1-837, Near Pollution Control Board, RIICO Industrial Area, Bhiwadi, Distt. Khairthal-Tijara (Rajasthan)-301019

Ph. No. : 09694666022, Email : asiaenvirolab@gmail.com, Website : www.asiaenvirolab.com

Test Report

Report No.: AEL/THC/27092025/W/07	Reporting Date:03/10/2025

Issued to:	
M/s TPL-HCC BHIVPURI PSP JOINT VENTURE (Bhivpuri Pumped Storage Project)	**Sample I'd** : AEL/THC/270925/W/07
Survey No-1, PO-Bhivpuri Camp I Taluka- Karjat I Dist-Raigad I Maharashtra - 410201	**Date** : 27.09.2025
	Period of testing : 27.09.2025 to 03.10.2025

SAMPLE PARTICULARS:	
Type of the Sample	Canal Outlet Water Sample
Date of Sampling	26.09.2025
Point of Sample Collection	From Tap (Tata Power Plant Office Area Under Bridge)
Sample Collected By	Customer
Purpose of Analysis	Monitoring

TEST RESULTS:

Sr. No.	Parameters	Unit	Results	Drinking Water Specifications (As per IS-10500)		Test Protocol
				Desirable Limits	Permissible Limits in the absence of better alternate source	
1	Colour	Hazen	<5	5 max.	15 max.	APHA 24th Ed.,2120 B
2	Odour	--	Agreeable	Agreeable	Agreeable	IS-3025(P-5)
3	Turbidity	NTU	<0.1	1 max.	5 max	APHA 24th Ed.,2130 B
4	pH	--	7.28	6.5 – 8.5	No relaxation	APHA 24th Ed.,4500 H B
5	Total Hardness,(as $CaCO_3$)	mg/l	27.6	200 max.	600 max.	APHA 24th Ed.,2340 C
6	Iron,(as Fe)	mg/l	<0.02	1.0 max.	No relaxation.	APHA 24th Ed. P-3111,A,B,C
7	Chloride,(as Cl)	mg/l	8.8	250 max.	1000 max.	APHA 24th Ed.,4500 ClB
8	Residual Free Chlorine	mg/l	<0.1	0.20 max.	1 max	APHA 24th Ed.,4500 Cl
9	Calcium (as Ca)	mg/l	7.7	75 max.	200 max.	APHA 24th Ed.,3500 CaA
10	Magnesium,(as Mg)	mg/l	2.0	30 max.	100 max.	APHA 24th Ed.,3500 Mg B
11	Total Dissolved Solids	mg/l	54.0	500 max.	2000 max.	APHA 24th Ed.,2540 C
12	Sulphate,(as SO_4)	mg/l	2.9	200 max.	400 max.	APHA 24th Ed.,4500 SO4 E
13	Fluoride,(as F)	mg/l	<0.1	1.0 max.	1.5 max.	APHA 24th Ed.,4500
14	Total Alkalinity,(as $CaCO_3$)	mg/l	28.0	200 max.	600 max.	APHA 24th Ed.,2320 A
15	Chromium Total,(as Cr)	mg/l	<0.02	0.05 max.	No relaxation	APHA 24th Ed. P-3111,A,B,C
16	Mercury, (as Hg)	mg/l	N.D.	0.001 max	No relaxation	APHA 24th Ed. P-3111,A,B,C
17	Nitrate,(as NO_3)	mg/l	1.65	45 max.	No relaxation	IS-3025(P-34)
18	Zinc,(as Zn)	mg/l	<0.02	5 max.	15 max.	APHA 24th Ed. P-3111,A,B,C

Note: 1. The result listed refer only to the tested samples and applicable parameters.
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Job Description : Environmental Testing, ETP/STP Manufacturing, ETP/STP Plant Opetation Pollution NOC Etc.

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Report No.: AEL/THC/27092025/W/07					Reporting Date:03/10/2025	
19	Phenolic Compounds, (as C_6H_5OH)	mg/l	<0.001	0.001 max.	0.002 max.	APHA 24th Ed. P- 5530 C
20	Copper,(as Cu)	mg/l	<0.02	0.05 max.	1.50 max.	APHA 24th Ed. P-3111,A,B,C
21	Manganese,(as Mn)	mg/l	<0.02	0.10 max.	0.30 max.	APHA 24th Ed. P-3111,A,B,C
22	Cobalt	mg/l	<0.02	--	--	APHA 24th Ed.,3111 A B C
23	Aluminum, (as Al)	mg/l	<0.01	0.03 max.	0.20 max.	APHA 24th Ed. P-3111,A,B,C
24	Cyanide ,(as CN)	mg/l	N.D.	0.05 max.	No relaxation	APHA 24th Ed. P- 4500 CN
25	Lead,(as Pb)	mg/l	<0.01	0.01 max.	No relaxation	APHA 24th Ed. P-3111,A,B,C
26	Cadmium, (as Cd)	mg/l	N.D.	0.003 max.	No relaxation	APHA 24th Ed. P-3111,A,B,C
27	Molybdenum (as Mo)	mg/l	< 0.01	0.07 max.	No relaxation	APHA 24th Ed. P-3111,A,B,C
28	Boron, (as B)	mg/l	<0.2	0.5 max	1.0 max	APHA 24th Ed.,4500 B C
29	Silver (as Ag)	mg/l	< 0.02	0.1 max.	No relaxation	APHA 24th Ed. P-3111,A,B,C
30	Selenium,(as Se)	mg/l	<0.01	0.01 max	No relaxation	APHA 24th Ed. P-3111,A,B,C
31	Anionic detergents (as MBAS)	mg/l	<0.1	0.2 max	1.0 max	IS 3025(P-68)-2019
32	Sulphide (as H_2S)	mg/l	N.D.	0.05 max	No relaxation	APHA 24th Ed.,4500S^2
33	Ammonia (as total ammonia-N)	mg/l	<0.1	0.5 max	No relaxation	IS-3025(P-34)
34	Chloramines (as CL_2)	mg/l	<0.1	4.0	No Relaxation	IS 3025 (P-26)-2021
35	Barium (as Ba)	mg/l	<0.01	0.7 max.	No relaxation	APHA 24th Ed.,3111 A B C
36	Nickel (as Ni)	mg/l	<0.02	0.02 max.	No relaxation	APHA 24th Ed.,3111 A B C
37	Vanadium	mg/l	<0.01	--	--	APHA 24th Ed.,3111 A B C
Bacteriological Test Results						
38	Coli form organisms/100 ml	--	Absent	Shall not be detectable in any 100 ml sample		IS-15185:2016
39	E-Coli/ 100 ml	--	Absent	Shall not be detectable in any 100 ml sample		IS-15185:2016
40	Faecal-Coli/ 100 ml	--	Absent	Shall not be detectable in any 100 ml sample		IS-1622:1981

Remarks- N.D- Not Detectable

*******End of Test Report*******

Checked By

Authorized Signatory

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Job Description : Environmental Testing, ETP/STP Manufacturing, ETP/STP Plant Operation Pollution NOC Etc

Lab - H1-837, Near Pollution Control Board, RIICO Industrial Area, Bhiwadi, Distt. Khairthal-Tijara (Rajasthan)-301019

Ph. No. : 09694666022, Email : asiaenvirolab@gmail.com, Website : www.asiaenvirolab.com

Test Report

Report No.: AEL/THC/27092025/W/08	Reporting Date:03/10/2025

Issued to:	
M/s TPL-HCC BHIVPURI PSP JOINT VENTURE	**Sample I'd** : AEL/THC/270925/W/08
(Bhivpuri Pumped Storage Project)	**Date** : 27.09.2025
Survey No-1, PO-Bhivpuri Camp I Taluka- Karjat I Dist-Raigad I Maharashtra - 410201	**Period of testing** : 27.09.2025 to 03.10.2025

SAMPLE PARTICULARS:	
Type of the Sample	Canal Outlet Water Sample
Date of Sampling	26.09.2025
Point of Sample Collection	From Tap (Tata Power Plant Dumping Yard)
Sample Collected By	Customer
Purpose of Analysis	Monitoring

TEST RESULTS:

Sr. No.	Parameters	Unit	Results	Drinking Water Specifications (As per IS-10500)		Test Protocol
				Desirable Limits	Permissible Limits in the absence of better alternate source	
1	Colour	Hazen	<5	5 max.	15 max.	APHA 24th Ed.,2120 B
2	Odour	--	Agreeable	Agreeable	Agreeable	IS-3025(P-5)
3	Turbidity	NTU	<0.1	1 max.	5 max	APHA 24th Ed.,2130 B
4	pH	--	7.58	6.5 – 8.5	No relaxation	APHA 24th Ed.,4500 H B
5	Total Hardness,(as $CaCO_3$)	mg/l	132.4	200 max.	600 max.	APHA 24th Ed.,2340 C
6	Iron,(as Fe)	mg/l	<0.02	1.0 max.	No relaxation.	APHA 24th Ed. P-3111,A,B,C
7	Chloride,(as Cl)	mg/l	14.7	250 max.	1000 max.	APHA 24th Ed.,4500 ClB
8	Residual Free Chlorine	mg/l	<0.1	0.20 max.	1 max	APHA 24th Ed.,4500 Cl
9	Calcium (as Ca)	mg/l	24.2	75 max.	200 max.	APHA 24th Ed.,3500 CaA
10	Magnesium,(as Mg)	mg/l	17.4	30 max.	100 max.	APHA 24th Ed.,3500 Mg B
11	Total Dissolved Solids	mg/l	180.0	500 max.	2000 max.	APHA 24th Ed.,2540 C
12	Sulphate,(as SO_4)	mg/l	13.8	200 max.	400 max.	APHA 24th Ed.,4500 SO4 E
13	Fluoride,(as F)	mg/l	<0.1	1.0 max.	1.5 max.	APHA 24th Ed.,4500
14	Total Alkalinity,(as $CaCO_3$)	mg/l	89.4	200 max.	600 max.	APHA 24th Ed.,2320 A
15	Chromium Total,(as Cr)	mg/l	<0.02	0.05 max.	No relaxation	APHA 24th Ed. P-3111,A,B,C
16	Mercury, (as Hg)	mg/l	N.D.	0.001 max	No relaxation	APHA 24th Ed. P-3111,A,B,C
17	Nitrate,(as NO_3)	mg/l	3.87	45 max.	No relaxation	IS-3025(P-34)
18	Zinc,(as Zn)	mg/l	<0.02	5 max.	15 max.	APHA 24th Ed. P-3111,A,B,C

Note: 1. The result listed refer only to the tested samples and applicable parameters.
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Job Description : Environmental Testing, ETP/STP Manufacturing, ETP/STP Plant Operation Pollution NOC Etc.

Lab - H1-837, Near Pollution Control Board, RIICO Industrial Area, Bhiwadi, Distt. Khairthal-Tijara (Rajasthan)-301019

Ph. No. : 09694666022, Email : asiaenvirolab@gmail.com, Website : www.asiaenvirolab.com

Report No.: AEL/THC/27092025/W/08					Reporting Date:03/10/2025	
19	Phenolic Compounds, (as C_6H_5OH)	mg/l	<0.001	0.001 max.	0.002 max.	APHA 24th Ed. P- 5530 C
20	Copper,(as Cu)	mg/l	<0.02	0.05 max.	1.50 max.	APHA 24th Ed. P-3111,A,B,C
21	Manganese,(as Mn)	mg/l	<0.02	0.10 max.	0.30 max.	APHA 24th Ed. P-3111,A,B,C
22	Cobalt	mg/l	<0.02	--	--	APHA 24th Ed.,3111 A B C
23	Aluminum, (as Al)	mg/l	<0.01	0.03 max.	0.20 max.	APHA 24th Ed. P-3111,A,B,C
24	Cyanide ,(as CN)	mg/l	N.D.	0.05 max.	No relaxation	APHA 24th Ed. P- 4500 CN
25	Lead,(as Pb)	mg/l	<0.01	0.01 max.	No relaxation	APHA 24th Ed. P-3111,A,B,C
26	Cadmium, (as Cd)	mg/l	N.D.	0.003 max.	No relaxation	APHA 24th Ed. P-3111,A,B,C
27	Molybdenum (as Mo)	mg/l	< 0.01	0.07 max.	No relaxation	APHA 24th Ed. P-3111,A,B,C
28	Boron, (as B)	mg/l	<0.2	0.5 max	1.0 max	APHA 24th Ed.,4500 B C
29	Silver (as Ag)	mg/l	< 0.02	0.1 max.	No relaxation	APHA 24th Ed. P-3111,A,B,C
30	Selenium,(as Se)	mg/l	<0.01	0.01 max	No relaxation	APHA 24th Ed. P-3111,A,B,C
31	Anionic detergents (as MBAS)	mg/l	<0.1	0.2 max	1.0 max	IS 3025(P-68)-2019
32	Sulphide (as H_2S)	mg/l	N.D.	0.05 max	No relaxation	APHA 24th Ed.,4500S^2
33	Ammonia (as total ammonia-N)	mg/l	<0.1	0.5 max	No relaxation	IS-3025(P-34)
34	Chloramines (as CL_2)	mg/l	<0.1	4.0	No Relaxation	IS 3025 (P-26)-2021
35	Barium (as Ba)	mg/l	<0.01	0.7 max.	No relaxation	APHA 24th Ed.,3111 A B C
36	Nickel (as Ni)	mg/l	<0.02	0.02 max.	No relaxation	APHA 24th Ed.,3111 A B C
37	Vanadium	mg/l	<0.01	--	--	APHA 24th Ed.,3111 A B C
Bacteriological Test Results						
38	Coli form organisms/100 ml	--	Absent	Shall not be detectable in any 100 ml sample		IS-15185:2016
39	E-Coli/ 100 ml	--	Absent	Shall not be detectable in any 100 ml sample		IS-15185:2016
40	Faecal-Coli/ 100 ml	--	Absent	Shall not be detectable in any 100 ml sample		IS-1622:1981

Remarks- N.D- Not Detectable

*******End of Test Report*******

Checked By

Authorized Signatory

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Test Report

Report No.: AEL/THC/27092025/W/09	Reporting Date:03/10/2025

Issued to:	Sample I'd : AEL/THC/270925/W/09 Date : 27.09.2025 Period of testing : 27.09.2025 to 03.10.2025
M/s TPL-HCC BHIVPURI PSP JOINT VENTURE **(Bhivpuri Pumped Storage Project)** Survey No-1, PO-Bhivpuri Camp I Taluka- Karjat I Dist-Raigad I Maharashtra - 410201	

SAMPLE PARTICULARS:	
Type of the Sample	Drinking Water Sample
Date of Sampling	26.09.2025
Point of Sample Collection	From RO (Guest House Karjat)
Sample Collected By	Customer
Purpose of Analysis	Monitoring

TEST RESULTS:

Sr. No.	Parameters	Unit	Results	Drinking Water Specifications (As per IS-10500)		Test Protocol
				Desirable Limits	Permissible Limits in the absence of better alternate source	
1	Colour	Hazen	<5	5 max.	15 max.	APHA 24th Ed.,2120 B
2	Odour	--	Agreeable	Agreeable	Agreeable	IS-3025(P-5)
3	Taste	--	Agreeable	Agreeable	Agreeable	IS-3025(P-8)
4	Turbidity	NTU	<0.1	1 max.	5 max	APHA 24th Ed.,2130 B
5	pH	--	6.40	6.5 – 8.5	No relaxation	APHA 24th Ed.,4500 H B
6	Total Hardness,(as $CaCO_3$)	mg/l	<1.0	200 max.	600 max.	APHA 24th Ed.,2340 C
7	Iron,(as Fe)	mg/l	<0.02	1.0 max.	No relaxation.	APHA 24th Ed. P-3111,A,B,C
8	Chloride,(as Cl)	mg/l	8.8	250 max.	1000 max.	APHA 24th Ed.,4500 ClB
9	Residual Free Chlorine	mg/l	<0.1	0.20 max.	1 max	APHA 24th Ed.,4500 Cl
10	Calcium (as Ca)	mg/l	<1.0	75 max.	200 max.	APHA 24th Ed.,3500 CaA
11	Magnesium,(as Mg)	mg/l	<1.0	30 max.	100 max.	APHA 24th Ed.,3500 Mg B
12	Total Dissolved Solids	mg/l	21.0	500 max.	2000 max.	APHA 24th Ed.,2540 C
13	Sulphate,(as SO_4)	mg/l	<1.0	200 max.	400 max.	APHA 24th Ed.,4500 SO4 E
14	Fluoride,(as F)	mg/l	<0.1	1.0 max.	1.5 max.	APHA 24th Ed.,4500
15	Total Alkalinity,(as $CaCO_3$)	mg/l	<1.0	200 max.	600 max.	APHA 24th Ed.,2320 A
16	Chromium Total,(as Cr)	mg/l	<0.02	0.05 max.	No relaxation	APHA 24th Ed. P-3111,A,B,C
17	Mercury, (as Hg)	mg/l	N.D.	0.001 max	No relaxation	APHA 24th Ed. P-3111,A,B,C
18	Nitrate,(as NO_3)	mg/l	<0.2	45 max.	No relaxation	IS-3025(P-34)

Note: 1. The result listed refer only to the tested samples and applicable parameters.
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Report No.: AEL/THC/27092025/W/09					Reporting Date:03/10/2025	
19	Zinc,(as Zn)	mg/l	<0.02	5 max.	15 max.	APHA 24th Ed. P-3111,A,B,C
20	Phenolic Compounds, (as C_6H_5OH)	mg/l	<0.001	0.001 max.	0.002 max.	APHA 24th Ed. P- 5530 C
21	Copper,(as Cu)	mg/l	<0.02	0.05 max.	1.50 max.	APHA 24th Ed. P-3111,A,B,C
22	Manganese,(as Mn)	mg/l	<0.02	0.10 max.	0.30 max.	APHA 24th Ed. P-3111,A,B,C
23	Chloramines(as Cl_2)	mg/l	<0.1	4.0 max.	No relaxation	IS 3025 (P-26)-2021
24	Aluminum, (as Al)	mg/l	<0.01	0.03 max.	0.20 max.	APHA 24th Ed. P-3111,A,B,C
25	Cyanide ,(as CN)	mg/l	N.D.	0.05 max.	No relaxation	APHA 24th Ed. P- 4500 CN
26	Lead,(as Pb)	mg/l	<0.01	0.01 max.	No relaxation	APHA 24th Ed. P-3111,A,B,C
27	Cadmium, (as Cd)	mg/l	N.D.	0.003 max.	No relaxation	APHA 24th Ed. P-3111,A,B,C
28	Molybdenum (as Mo)	mg/l	< 0.01	0.07 max.	No relaxation	APHA 24th Ed. P-3111,A,B,C
29	Boron, (as B)	mg/l	<0.2	0.5 max	1.0 max	APHA 24th Ed.,4500 B C
30	Silver (as Ag)	mg/l	< 0.02	0.1 max.	No relaxation	APHA 24th Ed. P-3111,A,B,C
31	Selenium,(as Se)	mg/l	<0.01	0.01 max	No relaxation	APHA 24th Ed. P-3111,A,B,C
32	Anionic detergents (as MBAS)	mg/l	<0.1	0.2 max	1.0 max	IS 3025(P-68)-2019
33	Sulphide (as H_2S)	mg/l	N.D.	0.05 max	No relaxation	APHA 24th Ed.,4500S^2
34	Ammonia (as total ammonia-N)	mg/l	<0.1	0.5 max	No relaxation	IS-3025(P-34)
35	Cobalt	mg/l	<0.02	--	--	APHA 24th Ed.,3111 A B C
36	Barium (as Ba)	mg/l	<0.01	0.7 max.	No relaxation	APHA 24th Ed.,3111 A B C
37	Nickel (as Ni)	mg/l	<0.02	0.02 max.	No relaxation	APHA 24th Ed.,3111 A B C
Bacteriological Test Results						
38	Coli form organisms/100 ml	--	Absent	Shall not be detectable in any 100 ml sample		IS-15185:2016
39	E-Coli/ 100 ml	--	Absent	Shall not be detectable in any 100 ml sample		IS-15185:2016
40	Faecal-Coli/ 100 ml	--	Absent	Shall not be detectable in any 100 ml sample		IS-1622:1981

Remarks- N.D- Not Detectable

*******End of Test Report*******

Checked By

Authorized Signatory

Note: 1. The result listed refer only to the tested samples and applicable parameters.
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Job Description : Environmental Testing, ETP/STP Manufacturing, ETP/STP Plant Operation Pollution NOC Etc.

Lab - H1-837, Near Pollution Control Board, RIICO Industrial Area, Bhiwadi, Distt. Khairthal-Tijara (Rajasthan)-301019

Ph. No. : 09694666022, Email : aslaenvirolab@gmail.com, Website : www.aslaenvirolab.com

Test Report

Report No.: AEL/THC/27092025/W/10	Reporting Date:03/10/2025

Issued to:	
M/s TPL-HCC BHIVPURI PSP JOINT VENTURE (Bhivpuri Pumped Storage Project)	**Sample I'd** : AEL/THC/270925/W/10
Survey No-1, PO-Bhivpuri Camp I Taluka- Karjat I Dist-Raigad I Maharashtra - 410201	**Date** : 27.09.2025
	Period of testing : 27.09.2025 to 03.10.2025

SAMPLE PARTICULARS:	
Type of the Sample	Domestic Water Sample
Date of Sampling	26.09.2025
Point of Sample Collection	From Tap (Labour Camp Kadav)
Sample Collected By	Customer
Purpose of Analysis	Monitoring

TEST RESULTS:

Sr. No.	Parameters	Unit	Results	Drinking Water Specifications (As per IS-10500)		Test Protocol
				Desirable Limits	Permissible Limits in the absence of better alternate source	
1	Colour	Hazen	<5	5 max.	15 max.	APHA 24th Ed.,2120 B
2	Odour	--	Agreeable	Agreeable	Agreeable	IS-3025(P-5)
3	Taste	--	Agreeable	Agreeable	Agreeable	IS-3025(P-8)
4	Turbidity	NTU	<0.1	1 max.	5 max	APHA 24th Ed.,2130 B
5	pH	--	7.78	6.5 – 8.5	No relaxation	APHA 24th Ed.,4500 H B
6	Total Hardness,(as $CaCO_3$)	mg/l	110.4	200 max.	600 max.	APHA 24th Ed.,2340 C
7	Iron,(as Fe)	mg/l	0.04	1.0 max.	No relaxation.	APHA 24th Ed. P-3111,A,B,C
8	Chloride,(as Cl)	mg/l	21.5	250 max.	1000 max.	APHA 24th Ed.,4500 ClB
9	Residual Free Chlorine	mg/l	<0.1	0.20 max.	1 max	APHA 24th Ed.,4500 Cl
10	Calcium (as Ca)	mg/l	23.1	75 max.	200 max.	APHA 24th Ed.,3500 CaA
11	Magnesium,(as Mg)	mg/l	12.7	30 max.	100 max.	APHA 24th Ed.,3500 Mg B
12	Total Dissolved Solids	mg/l	246.0	500 max.	2000 max.	APHA 24th Ed.,2540 C
13	Sulphate,(as SO_4)	mg/l	9.8	200 max.	400 max.	APHA 24th Ed.,4500 SO4 E
14	Fluoride,(as F)	mg/l	<0.1	1.0 max.	1.5 max.	APHA 24th Ed.,4500
15	Total Alkalinity,(as $CaCO_3$)	mg/l	33.3	200 max.	600 max.	APHA 24th Ed.,2320 A
16	Chromium Total,(as Cr)	mg/l	<0.02	0.05 max.	No relaxation	APHA 24th Ed. P-3111,A,B,C
17	Mercury, (as Hg)	mg/l	N.D.	0.001 max	No relaxation	APHA 24th Ed. P-3111,A,B,C
18	Nitrate,(as NO_3)	mg/l	3.58	45 max.	No relaxation	IS-3025(P-34)

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Report No.: AEL/THC/27092025/W/10				Reporting Date:03/10/2025		
19	Zinc,(as Zn)	mg/l	<0.02	5 max.	15 max.	APHA 24th Ed. P-3111,A,B,C
20	Phenolic Compounds, (as C_6H_5OH)	mg/l	<0.001	0.001 max.	0.002 max.	APHA 24th Ed. P- 5530 C
21	Copper,(as Cu)	mg/l	<0.02	0.05 max.	1.50 max.	APHA 24th Ed. P-3111,A,B,C
22	Manganese,(as Mn)	mg/l	<0.02	0.10 max.	0.30 max.	APHA 24th Ed. P-3111,A,B,C
23	Chloramines(as Cl_2)	mg/l	<0.1	4.0 max.	No relaxation	IS 3025 (P-26)-2021
24	Aluminum, (as Al)	mg/l	<0.01	0.03 max.	0.20 max.	APHA 24th Ed. P-3111,A,B,C
25	Cyanide ,(as CN)	mg/l	N.D.	0.05 max.	No relaxation	APHA 24th Ed. P- 4500 CN
26	Lead,(as Pb)	mg/l	<0.01	0.01 max.	No relaxation	APHA 24th Ed. P-3111,A,B,C
27	Cadmium, (as Cd)	mg/l	N.D.	0.003 max.	No relaxation	APHA 24th Ed. P-3111,A,B,C
28	Molybdenum (as Mo)	mg/l	< 0.01	0.07 max.	No relaxation	APHA 24th Ed. P-3111,A,B,C
29	Boron, (as B)	mg/l	<0.2	0.5 max	1.0 max	APHA 24th Ed.,4500 B C
30	Silver (as Ag)	mg/l	< 0.02	0.1 max.	No relaxation	APHA 24th Ed. P-3111,A,B,C
31	Selenium,(as Se)	mg/l	<0.01	0.01 max	No relaxation	APHA 24th Ed. P-3111,A,B,C
32	Anionic detergents (as MBAS)	mg/l	<0.1	0.2 max	1.0 max	IS 3025(P-68)-2019
33	Sulphide (as H_2S)	mg/l	N.D.	0.05 max	No relaxation	APHA 24th Ed.,4500S^2
34	Ammonia (as total ammonia-N)	mg/l	<0.1	0.5 max	No relaxation	IS-3025(P-34)
35	Cobalt	mg/l	<0.02	--	--	APHA 24th Ed.,3111 A B C
36	Barium (as Ba)	mg/l	<0.01	0.7 max.	No relaxation	APHA 24th Ed.,3111 A B C
37	Nickel (as Ni)	mg/l	<0.02	0.02 max.	No relaxation	APHA 24th Ed.,3111 A B C
Bacteriological Test Results						
38	Coli form organisms/100 ml	--	Absent	Shall not be detectable in any 100 ml sample		IS-15185:2016
39	E-Coli/ 100 ml	--	Absent	Shall not be detectable in any 100 ml sample		IS-15185:2016
40	Faecal-Coli/ 100 ml	--	Absent	Shall not be detectable in any 100 ml sample		IS-1622:1981

Remarks- N.D- Not Detectable

*******End of Test Report*******

Checked By

Authorized Signatory

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Ph. No. : 09694666022, Email : asiaenvirolab@gmail.com, Website : www.asiaenvirolab.com

Test Report

Report No.: AEL/THC/27092025/W/11	Reporting Date:03/10/2025

Issued to:	Sample I'd : AEL/THC/270925/W/11
M/s TPL-HCC BHIVPURI PSP JOINT VENTURE	**Date** : 27.09.2025
(Bhivpuri Pumped Storage Project)	**Period of testing** : 27.09.2025 to 03.10.2025
Survey No-1, PO-Bhivpuri Camp I Taluka- Karjat I Dist-Raigad I Maharashtra - 410201	

SAMPLE PARTICULARS:	
Type of the Sample	Domestic Water Sample
Date of Sampling	26.09.2025
Point of Sample Collection	From Tap (Guest House Kajrat)
Sample Collected By	Customer
Purpose of Analysis	Monitoring

TEST RESULTS:

Sr. No.	Parameters	Unit	Results	Drinking Water Specifications (As per IS-10500)		Test Protocol
				Desirable Limits	Permissible Limits in the absence of better alternate source	
1	Colour	Hazen	<5	5 max.	15 max.	APHA 24th Ed.,2120 B
2	Odour	--	Agreeable	Agreeable	Agreeable	IS-3025(P-5)
3	Turbidity	NTU	<0.1	1 max.	5 max	APHA 24th Ed.,2130 B
4	pH	--	7.73	6.5 – 8.5	No relaxation	APHA 24th Ed.,4500 H B
5	Total Hardness,(as $CaCO_3$)	mg/l	215.2	200 max.	600 max.	APHA 24th Ed.,2340 C
6	Iron,(as Fe)	mg/l	0.05	1.0 max.	No relaxation.	APHA 24th Ed. P-3111,A,B,C
7	Chloride,(as Cl)	mg/l	56.7	250 max.	1000 max.	APHA 24th Ed.,4500 ClB
8	Residual Free Chlorine	mg/l	<0.1	0.20 max.	1 max	APHA 24th Ed.,4500 Cl
9	Calcium (as Ca)	mg/l	41.9	75 max.	200 max.	APHA 24th Ed.,3500 CaA
10	Magnesium,(as Mg)	mg/l	26.8	30 max.	100 max.	APHA 24th Ed.,3500 Mg B
11	Total Dissolved Solids	mg/l	348.0	500 max.	2000 max.	APHA 24th Ed.,2540 C
12	Sulphate,(as SO_4)	mg/l	20.4	200 max.	400 max.	APHA 24th Ed.,4500 SO4 E
13	Fluoride,(as F)	mg/l	0.33	1.0 max.	1.5 max.	APHA 24th Ed.,4500
14	Total Alkalinity,(as $CaCO_3$)	mg/l	77.1	200 max.	600 max.	APHA 24th Ed.,2320 A
15	Chromium Total,(as Cr)	mg/l	<0.02	0.05 max.	No relaxation	APHA 24th Ed. P-3111,A,B,C
16	Mercury, (as Hg)	mg/l	N.D.	0.001 max	No relaxation	APHA 24th Ed. P-3111,A,B,C
17	Nitrate,(as NO_3)	mg/l	4.32	45 max.	No relaxation	IS-3025(P-34)
18	Zinc,(as Zn)	mg/l	<0.02	5 max.	15 max.	APHA 24th Ed. P-3111,A,B,C

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Report No.: AEL/THC/27092025/W/11					Reporting Date:03/10/2025	
19	Phenolic Compounds, (as C_6H_5OH)	mg/l	<0.001	0.001 max.	0.002 max.	APHA 24th Ed. P- 5530 C
20	Copper,(as Cu)	mg/l	<0.02	0.05 max.	1.50 max.	APHA 24th Ed. P-3111,A,B,C
21	Manganese,(as Mn)	mg/l	<0.02	0.10 max.	0.30 max.	APHA 24th Ed. P-3111,A,B,C
22	Cobalt	mg/l	<0.02	--	--	APHA 24th Ed.,3111 A B C
23	Aluminum, (as Al)	mg/l	<0.01	0.03 max.	0.20 max.	APHA 24th Ed. P-3111,A,B,C
24	Cyanide ,(as CN)	mg/l	N.D.	0.05 max.	No relaxation	APHA 24th Ed. P- 4500 CN
25	Lead,(as Pb)	mg/l	<0.01	0.01 max.	No relaxation	APHA 24th Ed. P-3111,A,B,C
26	Cadmium, (as Cd)	mg/l	N.D.	0.003 max.	No relaxation	APHA 24th Ed. P-3111,A,B,C
27	Molybdenum (as Mo)	mg/l	< 0.01	0.07 max.	No relaxation	APHA 24th Ed. P-3111,A,B,C
28	Boron, (as B)	mg/l	<0.2	0.5 max	1.0 max	APHA 24th Ed.,4500 B C
29	Silver (as Ag)	mg/l	< 0.02	0.1 max.	No relaxation	APHA 24th Ed. P-3111,A,B,C
30	Selenium,(as Se)	mg/l	<0.01	0.01 max	No relaxation	APHA 24th Ed. P-3111,A,B,C
31	Anionic detergents (as MBAS)	mg/l	<0.1	0.2 max	1.0 max	IS 3025(P-68)-2019
32	Sulphide (as H_2S)	mg/l	N.D.	0.05 max	No relaxation	APHA 24th Ed.,4500S^2
33	Ammonia (as total ammonia-N)	mg/l	<0.1	0.5 max	No relaxation	IS-3025(P-34)
34	Chloramines (as CL_2)	mg/l	<0.1	4.0	No Relaxation	IS 3025 (P-26)-2021
35	Barium (as Ba)	mg/l	<0.01	0.7 max.	No relaxation	APHA 24th Ed.,3111 A B C
36	Nickel (as Ni)	mg/l	<0.02	0.02 max.	No relaxation	APHA 24th Ed.,3111 A B C
37	Vanadium	mg/l	<0.01	--	--	APHA 24th Ed.,3111 A B C
Bacteriological Test Results						
38	Coli form organisms/100 ml	--	Absent	Shall not be detectable in any 100 ml sample		IS-15185:2016
39	E-Coli/ 100 ml	--	Absent	Shall not be detectable in any 100 ml sample		IS-15185:2016
40	Faecal-Coli/ 100 ml	--	Absent	Shall not be detectable in any 100 ml sample		IS-1622:1981

Remarks- N.D- Not Detectable

*******End of Test Report*******

Checked By

ASIA ENVIRO LAB INDIA PVT. LTD. Auth. Sign.

Authorized Signatory

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Feeding Hopper Covered

Stock Hopper Covered

Silo covered with Green Net

Water Sprinkling On road

Water sprinkling system provided in Rock Drilling Machine (ROC) to suppress Dust Emission

Water Sprinkling On road

Water sprinkling system provided in Rock Drilling Machine (ROC) to suppress Dust Emission

Section 10.2 CATCHMENT AREA TREATMENT PLAN

10.2 CATCHMENT AREA TREATMENT PLAN

It is a well-established fact that reservoirs formed by dams on rivers are subjected to sedimentation. The process of sedimentation embodies the sequential processes of erosion, entrainment, transportation, deposition and compaction of sediment. The steady erosion and sediment in reservoir reduce its capacity, and thus affecting the water availability for the designated use. The eroded sediment from catchment when deposited on streambeds and banks causes braiding of river reach. The removal of top fertile soil from catchment adversely affects the land productivity in the area. Thus, a well-designed Catchment Area Treatment (CAT) Plan is essential to ameliorate the above-mentioned adverse effects of soil erosion. Soil erosion can be defined as detachment, transportation and deposition of soil particles from one place to other by means of transporting agent like air, water or animals. Soil erosion is mainly affected by rainfall intensity and runoff, slope gradient and length, soil erodibility and vegetation cover (landuse pattern). Therefore, study of erosion and sediment yield from catchments are of great importance. Soil erosion leads to:

- loss in production potential
- reduction in infiltration rates
- reduction in water-holding capacity
- loss of nutrients
- increase in tillage operation costs
- reduction in water supply

To control the rate of soil erosion in the catchment, Catchment Area Treatment (CAT) is an ineluctable part. The CAT plan pertains to preparation of a management plan for treatment of erosion prone areas through adequate preventive measures. An effective CAT plan is a key factor to make the project eco-friendly and sustainable. Thus, a well-designed Catchment Area Treatment (CAT) Plan is essential to ameliorate the above-mentioned adverse process of soil erosion. CAT plan essentially consists of the following steps.

1. Calculation of soil erosion using Revised Universal Soil Loss Equation (RUSLE), combined with Remote Sensing (RS) and Geographic Information System (GIS) technologies.
2. Prioritizing the areas for treatment using Silt Yield Index (SYI).
3. Planning of suitable erosion control measures.
4. Cost estimation for CAT plan.

10.2.1 Methodology Adopted for the Study

The various steps, covered in the study, are as follows:

- Defining study area
- Defining data requirement
- Data acquisition and preparation
- Output presentation

The above-mentioned steps are briefly described in the following paragraphs:

10.2.1.1 Defining Study Area

Purpose of the study is preparation of CAT plan for the Catchment Area of Bhivpuri Off-Stream Open Loop Pumped Storage Project. Since the upper reservoir is existing Thokerwadi reservoir therefore catchment area of the stream on which lower reservoir is proposed is being considered as study area. The lower reservoir and its dam are proposed on Khadki nala, the total catchment area of the Khadki nala at the dam site for the proposed lower reservoir is only **1.43 sq km (**refer **Figure 10.1)**. Further, the effective catchment area i.e. after excluding the area to be covered by the proposed project components such as lower reservoir and part of water conductor system is only **1.15 sq. km**. In view of this, an area of **1.15 sq km** is being considered as study area. Out of the total 1.15 sq km of study area, **0.79 sq. km** falls in Pune district and the rest **0.36 sq. km** falls in Raigad district.

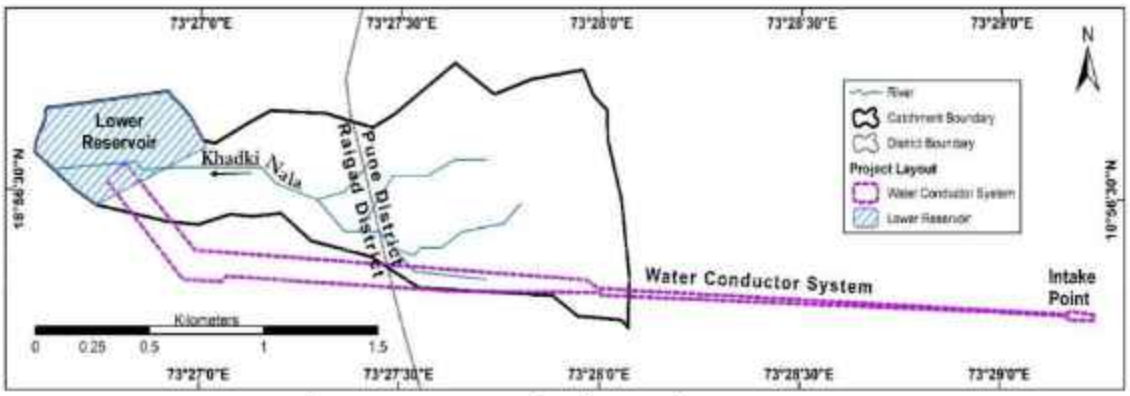

Figure 10.1: Map showing Catchment Area

In order to plan watershed management and to formulate action plans it requires micro-watershed delineation, therefore, catchment area was further delineated into micro-watershed. For the delineation of micro-watershed, Watershed Atlas of India prepared by Soil and Land Use Survey of India (SLUSI) has been referred. As per Watershed Atlas of India, the catchment area falls in a single Microwatershed. The nomenclature of Microwatershed has been assigned as follows: All drainage flowing into Arabian Sea except that at 1 Region (5); North Western Ghats Basin (5B); Savatri to Tapi Catchment (5B2); Ulhas Sub-Catchment (5B2B); Ulhas Watershed (5B2B7); Pej Subwatershed (5B2B7k); and Khadki Microwatershed (5B2B7k1).

10.2.2 Defining Data Requirement

Soil loss has been calculated through RUSLE (Revised Universal Soil Loss Equation) model which is computed by the following equation:

Soil Loss (A) = R*K*LS*C*P

Wherein; A = Soil loss (Tons/ha/year)

R is Rainfall & Runoff Erosivity Factor (MJ mm/ha-1/h-1/year-1), which depends upon the annual average rainfall in mm. Data required for R factor is rainfall intensity.

K is Soil Erodibility Factor (Tons/ha/h/ha-1/MJ-1/mm-1), which depends on the organic matter, texture permeability and profile structure of the soil. Also, it is a constant value for each soil type. Data required for K factor is soil type.

LS is Topographic Factor (dimensionless) which depends upon flow accumulation and steepness and length of slope in the area. Data required for LS factor is slope length and slope gradient.

C = Vegetation Cover and Crop Management Factor (dimensionless), which is the ratio of bare soil to vegetation and non- photosynthetic material. It is a constant value for each land use category. Data required for C factor is land use/ land cover.

P is Conservation Supporting Practice Factor (dimensionless), which takes into account specific erosion control practices like contour bunding, bench terracing etc.

10.2.3 Data Acquisition and Preparation

The data on various aspects was collected from different sources. Soil map of the catchment area was prepared from soil map of Maharashtra procured from Regional Centre of National Bureau of Soil Survey & Land Use Planning (NBSS&LUP), New Delhi. For the preparation of DEM and preparation of Slope map, Shuttle Radar Topography Mission (SRTM) 3 Arc-Second Global Digital Terrain Elevation Data (DTED) data has been used. For the preparation of land use/ land cover, map prepared by National Remote Sensing Centre (NRSC), Indian Space Research Organisation (ISRO) of Dept. of Space, Govt. of India with Partner Institution, Maharashtra Remote Sensing Application Centre, Govt. of Maharashtra has been used. The rainfall data in the catchment area has been sourced from Climatic Research Unit (CRU), a component of the University of East Anglia and one of the leading institutions concerned with the study of natural and anthropogenic climate change.

10.2.3.1 Soil

The catchment area is covered by a single Soil Mapping Unit i.e. 77, which is characterised by Very shallow, excessively drained, loamy soils on moderately steeply sloping highly dissected hill ranges with escarpments and narrow valleys with very severe erosion.

10.2.3.2 Land Use/ Land Cover

For the present study, land use/land cover maps prepared by National Remote Sensing Centre (NRSC), Indian Space Research Organisation (ISRO) of Dept. of Space with Maharashtra Remote Sensing Application Centre as partner institute has been used, in addition Google Earth was also referred.

The classified land use/ land cover map of the catchment area is shown as **Figure 10.2**. The land use/ land cover pattern of the catchment area has been given in **Table 10.2**. As can be seen from the map and table, the land use/ land cover pattern can be classified into five classes, out of these, deciduous forest covers the maximum area i.e. 85.43%, followed by scrub forest, covering 5.35%. Evergreen/ Semi Evergreen forest, agricultural land and fallow land covers 4.76%, 2.15% and 2.30% of the area respectively.

Table 10.2: Description of Soil Mapping Units in the Catchment Area

Land use/ Land cover Classes	Area (ha)	Area (%)
Evergreen/ Semi Evergreen Forest	6.80	4.76
Deciduous Forest	121.86	85.43
Scrub Forest	7.63	5.35
Agricultural Land	3.07	2.15

Land use/ Land cover Classes	Area (ha)	Area (%)
Fallow Land	3.28	2.30
Total	**142.64**	**100**

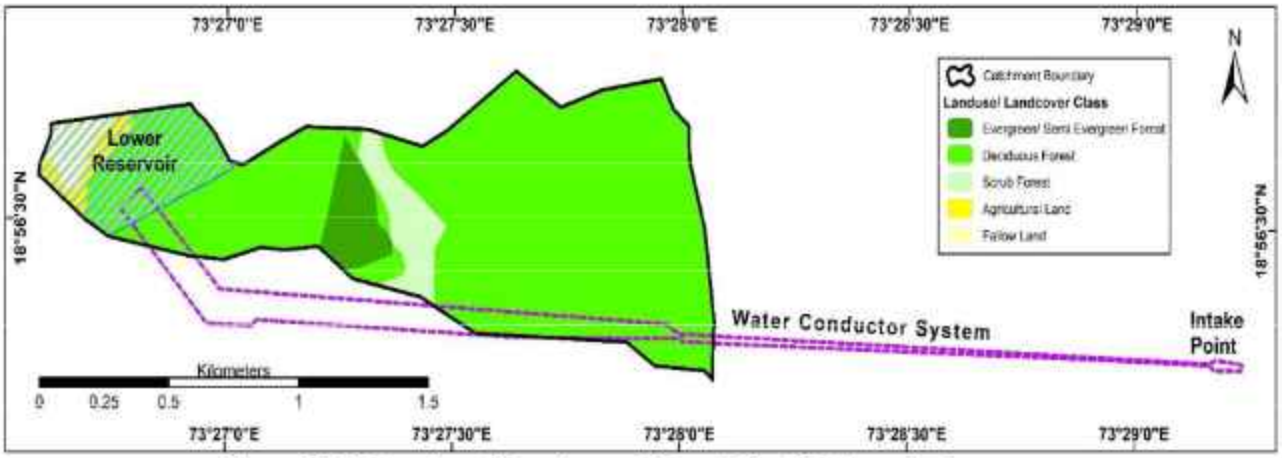

Figure 10.2: Land use/ Land cover Map of the Catchment Area

10.2.3.3 Slope

For the preparation of Slope map, Shuttle Radar Topography Mission (SRTM) 3 Arc-Second Global Digital Terrain Elevation Data (DTED) data has been used. The slope map in degrees prepared for the catchment area is given at **Figure 10.3**. In the Catchment Area, the slope ranges from 0 to around 47 degree.

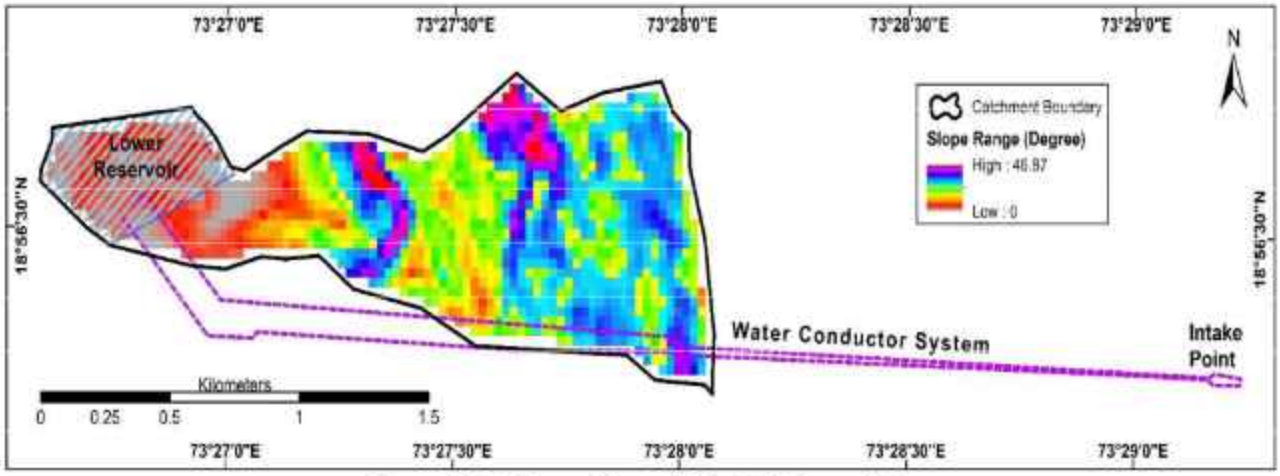

Figure 10.3: Slope Map of the Catchment Area

10.2.3.4 Rainfall

For the estimation of rainfall erosivity in the catchment area, average rainfall of 10 years has been taken from the High-resolution gridded CRU datasets. In the absence of site-specific periodic data, CRU data from the year 2011 to 2020 has been used for the calculation of R factor. In and around the Catchment Area, average rainfall of 10 years have been taken from the rain gauge station for the estimation of rainfall erosivity. The rainfall erosivity factor (R) has been calculated using equation R = 81.5 + 0.38X for annual average rainfall of observed and simulated data. The value of R i.e. 1039.40 has been adopted in this study to calculate soil erosion using RUSLE.

10.2.3.5 Conservation Support Practice (P) Factor`

The P factor is an expression of the effects of supporting conservation practices, such as contouring, buffer strips of vegetation, and terracing, on soil loss at a particular site. It is the ratio of soil loss with specific support practice to the corresponding loss with up-or down-slope cultivation. In the present study, the P factor has been considered as 1.

10.2.4 Output Presentation

A thematic map for soil loss of the catchment area has been prepared using RUSLE model mentioned in the above section. The catchment area was then demarcated into different soil erosion intensity mapping units or classes based upon the extent of soil loss (see **Table 10.3 & Figure 10.4**). The catchment area under different Erosion Intensity categories is given in **Table 10.3**. As can be seen from the figure and table, around 24% of catchments are prone to less than 1 tons/ha/annum soil erosion, i.e. under negligible erosion intensity category. 46.02% of its area is prone to Severe and Very Severe soil erosion.

Table 10.3: Area falling under different Erosion Intensity Categories

S. No.	Soil loss in tons/hectare/annum	Erosion Intensity Category	Area (ha)	Area (%)
1	<1	Negligible	34.36	24.09
2	1-5	Slight	9.15	6.41
3	5-10	Very Low	6.28	4.40
4	10-20	Low	6.99	4.90
5	20-40	Moderate	20.23	14.18
6	40-80	Severe	37.62	26.37
7	>80	Very Severe	28.02	19.65
Total			**142.64**	**100**

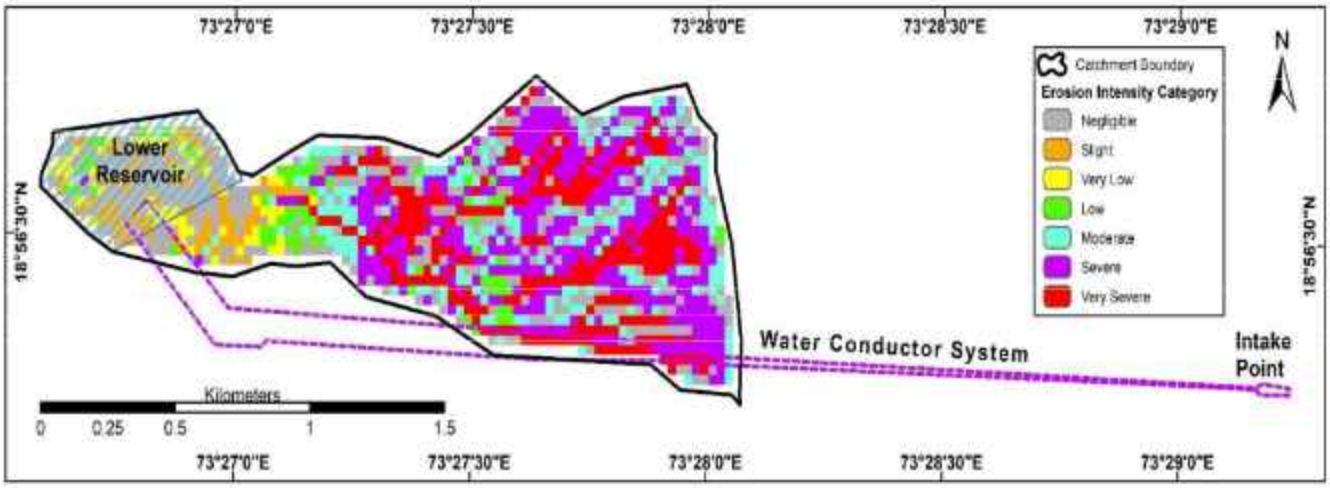

Figure 10.4: Erosion Intensity Map of the Catchment Area

10.2.5 Prioritization

`Silt Yield Index' (SYI), method conceptualized by Soil and Land Use Survey of India (SLUSI) is being used for prioritization of smaller hydrologic units within river valley project areas. Since the catchment area is only 1.43 sq km and could be delineated into only one micro watershed, therefore, prioritization is not applicable in the present study.

10.2.6 TREATMENT PLAN

10.2.6.1 Area to be taken up for Treatment

Area under severe and very severe erosion intensity category will be taken up for treatment. To arrive at such an area, first of all areas under severe and very severe erosion intensity category was extracted, which comes out to be **65.64 ha (**refer **Table 10.3).** Thereafter, areas under severe and very severe erosion intensity category falling within the proposed reservoir and water conductor system area were removed as once the project is constructed this area will not be available for treatment. The area thus arrived at and considered as treatable area comes out to be **60.38 ha** (or say **60** ha). Out of the total 60 ha to be treated, it is proposed to treat **26 ha** by biological measures and the rest **34.0 ha** by engineering measures.

Out of the total 60.38 ha to be treated, 48.99 ha falls in Pune district and the rest 11.38 ha falls in Raigad district.

The period for implementing treatment measures including maintenance has been taken as 7 years. It is proposed to prepare micro plans for microwatershed, establish administrative setup and implement other entry point activities in the first year itself. The maintenance period (only for biological measures) will be for subsequent 5 years.

10.2.6.2 Treatment Measures

Watershed management is the optimal use of soil and water resources within a given geographical area so as to enable sustainable production. It implies changes in land use, vegetative cover, and other structural and non-structural action that are taken in a watershed to achieve specific watershed management objectives. The overall objectives of watershed management programme are to:

- increase infiltration into soil;
- control excessive runoff;
- manage & utilize runoff for useful purposes.

i. Biological Measures

The biological measures would comprise of:

- Normal Afforestation
- Aided Natural Regeneration

A. Normal Afforestation

A well stocked forest is the best insurance against soil loss as well as for ecological rehabilitation. It is therefore proposed to increase the vegetation cover in the tract. For this, patches of tree cover falling under severe and very severe erosion intensity category shall be brought under afforestation. The locality factors prevalent in the area such as fires, grazing etc. are fairly adverse to the establishment of plantations. Thus, special and intensive efforts are needed to ensure the success of afforestation work. Owing to the above enumeration factors, the plantation will require higher levels of maintenance also. This will include raising of multi-tier mixed vegetation of suitable local species. 2500 plants per hectare will be planted under this scheme. Planting will be done in pits. Earth work should be done well in advance. Plants should be healthy with strong stems. Planting should be done in June when

the water supply starts. Further, it is assessed that it is essential to make provision for soil and moisture conservation measures in the areas proposed for afforestation. Provision had been made for undertaking various necessary soil and moisture conservation measures in these areas. Provision is also made for five years maintenance of afforestation undertaken as part of the watershed management. The unit cost for afforestation including maintenance cost for five years is estimated to be Rs 6,28,030/- per ha. The detailed estimate is sourced from the Rate Structure for Compensatory Afforestation Model No. 1 prepared by the Sawantwadi Forest Division for the diversion of forest land for the project "Construction of Minor Irrigation Tank in Nirukhe Village Tal- Kudal Dist- Sindhudurg". The detailed cost norm thus prepared after making necessary changes and adopting current wage rate is furnished in **Annexure-VIII**. The area to be brought under afforestation **4 ha**.

B. Aided Natural Regeneration

In certain areas, conditions are conducive to natural regeneration provided some sort of assistance is provided. Such area shall be taken up under this component. The areas shall be closed to reduce biotic interference. Ground surface will be cleared of slash, debris and felling refuse to afford a clean seed bed to the falling seed. At certain places some soil raking may also have to be done to facilitate germination of seeds. Where natural regeneration is found deficient. It will be supplemented by artificial planting. Patch sowing in suitable areas may also be done. 625 plants per hectare will be planted under this scheme. The plantation will be maintained for subsequent five years. The unit cost for aided natural regeneration including maintenance cost for five years is estimated to be Rs. 3,66,840 per ha. The detailed estimate is furnished in **Annexure-VIII**. The area to be brought under aided natural regeneration is **22 ha**.

ii. Engineering Measures

Larger gullies must be treated to prevent further deepening and widening. The purpose of engineering measures is to reduce the gradient, reduce the flow velocity and protect the stream bank. The water is guided safely from a higher elevation to a lower elevation without causing erosion at the gully/nala bed and banks. The water pools behind the engineering promotes the percolation into the soils. Check dam/ check wall is one such engineering measure. The cost considered for the soil and moisture works is Rs. 13,748.50/- per ha. This cost includes collection of rubbles from areas upto 30m and considering the wage rate as Rs. 443.50 per man day. The cost is sourced from the Rate Structure for Compensatory Afforestation Model No. 1 prepared by the Sawantwadi Forest Division for the diversion of forest land for the project "Construction of Minor Irrigation Tank in Nirukhe Village Tal- Kudal Dist- Sindhudurg". Total area considered to be treated by the soil and moisture conservation measure is **32 ha**.

10.2.7 OTHER COMPONENTS OF CAT PLAN

Apart from the biological and engineering treatment measures in the catchment area there are other aspects of the CAT Plan to be addressed and their cost included in the overall cost estimate of the plan. The charges for operational support, forest protection, social mobilization, documentation and publication, monitoring and evaluation and providing environmental services are some of the integral ingredients which have to be considered and included while formulating the CAT plans.

10.2.7.1 Administrative Charges

For an efficient management of forest resources, it is essential that operational support to the Forest Department is adequately developed. Similarly, in remote localities there are no places for shelter for the staff, people and trekkers. Therefore, a budgetary provision of **Rs. 2.20 lakh** has been kept as administrative charges.

10.2.7.2 Provision for Micro Planning

The year-wise areas requiring treatment measures have been suggested but have not been marked. The spatial location of specific treatment to be carried out in the catchment area would require extensive detailing during the implementation of CAT and a provision for micro-planning has been made in the total CAT financial allocation. For this purpose, a provision of **Rs. 1.10 lakh** is being made.

10.2.7.3 Monitoring & Evaluation

Monitoring and evaluation will be undertaken as a part of project management. A process of self-evaluation at specified intervals of time will ensure the field level verification of suggested treatment measures and efficacy of the CAT plan.

The year-wise areas requiring treatment measures have been suggested but have not been marked. The spatial location of specific treatment to be carried out in the Catchment Area would require extensive detailing during the implementation of CAT and a provision for micro-planning has been made in the total CAT financial allocation. Thereafter, annual work plan would be prepared well in advance after undertaking initial ground surveys during micro-planning, specifying physical and financial targets, sites, locations and beneficiaries of each component of the project activity. Month-wise work schedule of various items of each component for the financial year would also be prepared in advance and its timely implementation would be ensured. Monthly progress report on all activities would be submitted by the Range Officers to Divisional Forest Officer. The monitoring committee shall be constituted at the project level for this purpose which too would monitor on a regular basis the quality and quantity of works being carried out under the CAT plan area. A provision of **Rs. 2.20 lakh** has been made for this component.

10.2.7.4 Contingencies

A provision of **Rs. 5.51 lakh** has been kept under this component for some leeway to adjust any unforeseen expenditure.

10.2.8 COST ESTIMATE

The estimated cost of implementation of Catchment Area Treatment Plan as defined above is **Rs. 121.25 lakh** and is given at **Table 10.4**. Year wise physical and financial targets for the entire catchment area, for catchment area falling under Pune district and for catchment area falling under Raigad district are given in **Table 10.5, 10.6** and **10.7** respectively.

Table 10.4: Estimated Cost of Catchment Area Treatment Plan Implementation

S. No.	Item	Rate (Rs)	Unit	Pune District		Raigad District		Catchment Area	
				Physical	Financial (Rs in lakh)	Physical	Financial (Rs in lakh)	Physical	Financial (Rs in lakh)
	Biological Measures								
1	Normal Afforestation	6,28,030	ha	1.00	6.28	3.00	18.84	4.00	**25.12**
2	Aided Natural Regeneration	3,66,840	ha	15.00	55.03	7.00	25.68	22.00	**80.70**
	Sub Total A				**61.31**		**44.52**		**105.83**
	Engineering Measures								
3	Soil & Moisture Works	13,748.50	ha	32.00	4.40	0.00	0.00	32.00	**4.40**
	Sub Total B				4.40		0.00		**4.40**
I	**Total A and B**				**65.71**		**44.52**		**110.23**
II	**Other Components**								
4	Administrative Expenditure				1.31		0.89		**2.20**
5	Micro Planning				0.66		0.45		**1.10**
6	Monitoring & Evaluation				1.31		0.89		**2.20**
7	Contingency				3.29		2.23		**5.51**
	Total II				**6.57**		**4.45**		**11.02**
	Grand Total				**72.28**		**48.97**		**121.25**

Table 10.5: Year Wise Phasing of Physical and Financial Targets for Pune District

S. No.	Measures	Year I		Year II		Year III		Year IV		Year V		Year VI		Year VII		Total	
		Phy.	Fin. (Rs in lakh)	Phy.	Fin. (Rs in lakh)	Phy.	Fin. (Rs in lakh)	Phy.	Fin. (Rs in lakh)	Phy.	Fin. (Rs in lakh)	Phy.	Fin. (Rs in lakh)	Phy.	Fin. (Rs in lakh)	Phy.	Fin. (Rs in lakh)
A	**Biological Measures**																
1	Afforestation (ha)																
	Pre Monsoon Works			1	3.64											**1**	**3.64**
	First Year Operation					1	1.30									**1**	**1.30**
	Second Year Operation							1	0.58							**1**	**0.58**
	Third Year Operation									1	0.37					**1**	**0.37**
	Fourth Year Operation											1	0.19			**1**	**0.19**
	Fifth Year Operation													1	0.19	**1**	**0.19**
2	Aided Natural Regeneration (ha)																

S. No.	Measures	Year I		Year II		Year III		Year IV		Year V		Year VI		Year VII		Total	
		Phy.	Fin. (Rs in lakh)	Phy.	Fin. (Rs in lakh)	Phy.	Fin. (Rs in lakh)	Phy.	Fin. (Rs in lakh)	Phy.	Fin. (Rs in lakh)	Phy.	Fin. (Rs in lakh)	Phy.	Fin. (Rs in lakh)	Phy.	Fin. (Rs in lakh)
	Pre-Monsoon Works			15	18.00											15	18.00
	First Year Operation					15	19.92									15	19.92
	Second Year Operation							15	5.81							15	5.81
	Third Year Operation									15	5.81					15	5.81
	Fourth Year Operation											15	2.74			15	2.74
	Fifth Year Operation													15	2.74	15	2.74
	Sub Total A			**16**	**21.64**	**16**	**21.22**	**16**	**6.39**	**16**	**6.18**	**16**	**2.93**	**16**	**2.93**		**61.31**
B	**Engineering measures**																
3	Soil and Moisture Works			32	4.40											32	4.40
	Sub Total B			**32**	**4.40**											32	4.40
I	**Total A and B**				**26.04**		**21.22**		**6.39**		**6.18**		**2.93**		**2.93**		**65.71**
II	**Other Components**																
4	Administrative Expenditure		0.66		0.66												**1.31**
5	Micro Planning		0.66														**0.66**
6	Monitoring & Evaluation				0.52		0.42		0.13		0.12		0.06		0.06		**1.31**
7	Contingency				1.30		1.06		0.32		0.31		0.15		0.15		**3.29**
	Total II		**1.31**		**2.48**		**1.49**		**0.45**		**0.43**		**0.21**		**0.21**		**6.57**
	Grand Total (I and II)	0.00	**1.31**		**28.52**		**22.71**		**6.84**		**6.61**		**3.14**		**3.14**		**72.28**

Table 10.6: Year Wise Phasing of Physical and Financial Targets for Raigad District

S. No.	Measures	Year I		Year II		Year III		Year IV		Year V		Year VI		Year VII		Total	
		Phy.	Fin. (Rs in lakh)	Phy.	Fin. (Rs in lakh)	Phy.	Fin. (Rs in lakh)	Phy.	Fin. (Rs in lakh)	Phy.	Fin. (Rs in lakh)	Phy.	Fin. (Rs in lakh)	Phy.	Fin. (Rs in lakh)	Phy.	Fin. (Rs in lakh)
A	**Biological Measures**																
1	Afforestation (ha)																
	Pre Monsoon Works			3	10.93											**3**	**10.93**
	First Year Operation					3	3.89									**3**	**3.89**
	Second Year Operation							3	1.75							**3**	**1.75**
	Third Year Operation									3	1.11					**3**	**1.11**
	Fourth Year Operation											3	0.58			**3**	**0.58**
	Fifth Year Operation													3	0.58	**3**	**0.58**
2	Aided Natural																

S. No.	Measures	Year I		Year II		Year III		Year IV		Year V		Year VI		Year VII		Total	
		Phy.	Fin. (Rs in lakh)	Phy.	Fin. (Rs in lakh)	Phy.	Fin. (Rs in lakh)	Phy.	Fin. (Rs in lakh)	Phy.	Fin. (Rs in lakh)	Phy.	Fin. (Rs in lakh)	Phy.	Fin. (Rs in lakh)	Phy.	Fin. (Rs in lakh)
	Regeneration (ha)																
	Pre Monsoon Works			7	8.40											**7**	**8.40**
	First Year Operation					7	9.30									**7**	**9.30**
	Second Year Operation							7	2.71							**7**	**2.71**
	Third Year Operation									7	2.71					**7**	**2.71**
	Fourth Year Operation											7	1.28			**7**	**1.28**
	Fifth Year Operation													7	1.28	**7**	**1.28**
	Sub Total A			**10**	**19.33**	**10**	**13.19**	**10**	**4.46**	**10**	**3.82**	**10**	**1.86**	**10**	**1.86**		**44.52**
B	**Other Components**																
3	Administrative Expenditure		0.45		0.45												**0.89**
4	Micro Planning		0.45														**0.45**
5	Monitoring & Evaluation				0.39		0.26		0.09		0.08		0.04		0.04		**0.89**
6	Contingency				0.97		0.66		0.22		0.19		0.09		0.09		**2.23**
	Sub Total B		**0.89**		**1.80**		**0.92**		**0.31**		**0.27**		**0.13**		**0.13**		**4.45**
	Grand Total (A and B)		**0.89**		**21.13**		**14.11**		**4.77**		**4.09**		**1.99**		**1.99**		**48.97**

Table 10.7: Year Wise Phasing of Physical and Financial Targets for the Catchment Area

S. No.	Measures	Year I		Year II		Year III		Year IV		Year V		Year VI		Year VII		Total	
		Phy.	Fin. (Rs in lakh)	Phy.	Fin. (Rs in lakh)	Phy.	Fin. (Rs in lakh)	Phy.	Fin. (Rs in lakh)	Phy.	Fin. (Rs in lakh)	Phy.	Fin. (Rs in lakh)	Phy.	Fin. (Rs in lakh)	Phy.	Fin. (Rs in lakh)
A	**Biological Measures**																
1	Afforestation (ha)																
	Pre Monsoon Works			4	14.57											**4**	**14.57**
	First Year Operation					4	5.19									**4**	**5.19**
	Second Year Operation							4	2.33							**4**	**2.33**
	Third Year Operation									4	1.48					**4**	**1.48**
	Fourth Year Operation											4	0.77			**4**	**0.77**
	Fifth Year Operation													4	0.77	**4**	**0.77**
2	Aided Natural Regeneration (ha)																
	Pre Monsoon Works			22	26.40											**22**	**26.40**
	First Year Operation					22	29.22									**22**	**29.22**
	Second Year Operation							22	8.52							**22**	**8.52**

S. No.	Measures	Year I		Year II		Year III		Year IV		Year V		Year VI		Year VII		Total	
		Phy.	Fin. (Rs in lakh)	Phy.	Fin. (Rs in lakh)	Phy.	Fin. (Rs in lakh)	Phy.	Fin. (Rs in lakh)	Phy.	Fin. (Rs in lakh)	Phy.	Fin. (Rs in lakh)	Phy.	Fin. (Rs in lakh)	Phy.	Fin. (Rs in lakh)
	Third Year Operation									22	8.52					**22**	**8.52**
	Fourth Year Operation											22	4.02			**22**	**4.02**
	Fifth Year Operation													22	4.02	**22**	**4.02**
	Sub Total A			**26**	**40.98**	**26**	**34.41**	**26**	**10.86**	**26**	**10.00**	**26**	**4.79**	**26**	**4.79**		**105.83**
B	**Engineering measures**																
3	Soil and Moisture Works			32	4.40											**32**	**4.40**
	Sub Total B			**32**	**4.40**											**32**	**4.40**
I	**Total A and B**				**45.38**		**34.41**		**10.86**		**10.00**		**4.79**		**4.79**		**110.23**
II	**Other Components**																
4	Administrative Expenditure		1.10		1.10												**2.20**
5	Micro Planning		1.10														**1.10**
6	Monitoring & Evaluation				0.91		0.69		0.22		0.20		0.10		0.10		**2.20**
7	Contingency				2.27		1.72		0.54		0.50		0.24		0.24		**5.51**
	Total II		**2.20**		**4.28**		**2.41**		**0.76**		**0.70**		**0.34**		**0.34**		**11.02**
	Grand Total (I and II)		**2.20**		**49.65**		**36.82**		**11.62**		**10.70**		**5.12**		**5.12**		**121.25**

Annexure 14 - Blasting permission from DC

Read-

1. Application of Authorized Signatory, DirectorTata project, Bhivpuri Date31/12/2024.
2. Agreement between Deparment of Water Resources, Government of Maharashtra and The Tata Power Company Ltd. Date 12/08/2024.
3. Report of Tahsildar, Maval under No. kavi/276/2025 , dated. 30/05/2025
4. Report of Superintendent of Police Pune under No . 3707/2025 dated 06/06/2025
5. Explosive Rules 2008 rule 98 & 106

Office of the District Magistrate Pune
(Home Branch) No.PGS/SR/ 04 /2025
Date 11 /06/2025

No Objection Certificate

No Objection certificate is hereby granted as a point of view is concerned i.e. safety law and order to, the Memorandum of Understanding (MoU) between Tata Power Company Limited (TPCL) and the Government of Maharashtra in connection with the 1000 MW Bhivpuri Off-Stream Open-Loop Pumped Storage Project, for the purpose of obtaining blasting permission through SALVO INDUSTRIES PVT. LTD. For Ta. Maval t Dist. Pune Maharashtra.

S.NO.	TALUKA NAME	VILLAGE NAME	TOTAL VILLAGE IN NO.
1	Maval	Khand	1
		Total	1

This No Objection Certificate is issued subjected to the following conditions.

1. The blasting operations should be carried out only between sunrise & Sunset.
2. The explosives to be transported through explosive vans from magazine to the blasting site. After the blasting operation is over, the balance explosives should be returned to the magazine before sunset.
3. The blasting operation should be carried out with the help of approved blaster holding valid Shot Firer Permit.
4. Before carrying out the blasting operation the nearest police station should be informed.
5. The applicant will be responsible for -damage of public lives and property any willful conduct or negligence occurs.
6. This No Objection Certificate issued on a condition to obtain a necessary permission from the Dy. Chief Controller of explosive west circle, New Mumbai & Maharashtra Polution Control Board if required.
7. Please ensure the required royalty of minor mineral as per Government Norm is deposited to the concern authority if required.
8. The above No Objection Certificate is issued on the basis of report received from the Tahsildar, Maval under No. kavi/276/2025 , dated. 30/05/2025 and Superintendent of Police Pune under No . 3707/2025 dated 06/06/2025

TPCL-HCC Bhivpuri Joint Venture

9. **The work of blasting shall be done by** SALVO INDUSTRIES PVT. LTD. Explosive Licence No. E/HQ/TG /22/954 (E 102852), Renewal Dated-31/03/2029

10. SALVO INDUSTRIES PVT. LTD. Dist. Pune (Short Firer- Shri. Edla Chandra Mohn License No. E/SH/TG/30/714 (E 96165) Renewal Dated-11/11/2026
11. Consent of concerned farmer is mandatory for blasting.
12. If any farmer filed complaint regarding blasting, this office will not responsible for the same.
13. If there will be any loss to the crops, houses or property, the responsibility bears with SALVO INDUSTRIES PVT. LTD.
14. A water pipe line were going from Gat Nos from the villages of Khand Tah. Maval hence permission is granted for blasting where there are stones.
15. The No objection certificate is issued falls under Eco Sensitive Zone.
16. Whole responsibility of safe and secure blasting is lies with SALVO INDUSTRIES PVT. LTD.
17. The N.O.C. will be cancelled if any breach of conditions is noticed.
    This N.O.C. is valid for the period upto **one year** from the date of issue

ADDITIONAL DISTRICT MAGISTRATE ★ PUNE ★

(Ujwal Kadam)
Add. District Magistrate Pune

To

1. Authorized Signatory, SALVO INDUSTRIES PVT. LTD.

Copy to--

1. Chief Controller of explosive west circle, CBD Belapur, New Mumbai.
2. Superintendent of Police Pune for information and necessary action
3. Tahsildar Maval for information and necessary action

TPL-HCC Bhivpuri PSP Joint Venture

GOVERNMENT OF MAHARASHTRA
REVENUE & FOREST DEPARTMENT
Office of the District Collectorate or District Magistrate, Raigad - Alibag
Near Hirakot Lake, Taluasil - Alibag, District - Raigad 402201
Phone No. 02141 – 222118/222322, Fax NO.02141 – 227451
Email Id : deraigad@gmail.com

(Home Branch) No.DC/MAG-2/NOC/Bhivpuri Camp/Exp/Sr.No.62/2025 Date : 13/06/2025

Part-2

NO OBJECTION CERTIFICATE

(See Rules 102 and 103)

With reference to the application in Form AE-12 dated **17/04/2025** submitted by **M/s. Salvo Industries Private Ltd,** At.Plot No.17, Sri Malani, Co-op Housing Society, Indian Airlines Colony, Tirumalghery, Secunderabad, Village-Tirumalghery, Dist.Hyderabad, State-Telangana **(LE-3 Licence No.E/HQ/MH/22/954 (E102852), Valid till Dt.31/03/2029)** and in pursuance of rules 102 and 103 of the Explosives Rules, 2008, there is no objection for granting licence under the Explosives Rules, 2008 **to M/s.Salvo Industries Private Ltd,** of address At.Plot No.17, Sri Malani, Co-op Housing Society, Indian Airlines Colony, Tirumalghery, Secunderabad, Village-Tirumalghery, Dist.Hyderabad, State-Telangana for the following purpose, kinds and quantities of explosives in the premises at **Gut No.1, Village Bhivpuri Camp, Tal.Karjat, Dist.Raigad** Purpose (Note: Please write only one purpose corresponding to one Article No. as stated in Table of purposes and authority in Part 1 of Schedule IV annexed to the Explosives Rules, 2008) :-

Licence to possess for use, explosives of class 1, 2, 3, 4, 5, 6 or 7

1) Kinds and quantities of explosives: (As mentioned by applicant in application)

Sr. No.	Name of Explosives	Class	Div.	Quantity In One time
(a)	Nitrate Mixture	2	0	10000 Kg.
(b)	Safety Fuse	6	1	5000 Mtrs
(c)	Detonating Fuse	6	2	40000 Mtrs
(d)	Electric and / or Ordinary Detonators	6	3	44000 NOs

Note:- The following particulars have been verified/considered while issuing this No Objection Certificate.

a) The antecedents of the applicant (in case of individual or proprietary firm) /partners (in case of partnership company) or directors (in case of limited company) or office bearers in case of society or association and also occupier of the premises.
b) The lawful possession of the site by the applicant.
c) Interest of public.
d) Requirement of explosives for use in mines or quarries (possessed by the applicant) or in the area proposed by the licensee have been considered.
e) Genuineness of purpose.
f) Any other matter pertinent to public safety;

Conditions :-

1) Compliance with the provisions of the Explosives Rules, 2008 shall remain mandatory.
2) All such safety precautions shall remain mandatory during the use of explosives.
3) In case of danger or damage anyone's life or property during the use of explosives, the applicant and the licensee shall be fully responsible for the same.
4) While carrying out control blasting at the said location, it will be mandatory for all concerned to comply with the terms and conditions mentioned in the permission dated 19/05/2025 issued by the Ministry of Environment, Forest and Climate Change, Government of India.

HCC Bhivpuri PSP Joint Venture

Sd/-xxx
(Kishan N.Jawale)
District Magistrate Raigad

Copy- Chief Controller of Explosives PESO, A Block, 5 th floor, CGO Complex, Seminary Hills, Nagpur-440006.

Copy- Controller of Explosives, Mumbai, A-1 & A-2 Wing, 5th Floor, CGO Complex, CBD Belapur, Navi Mumbai - 400614.
Copy- Superintendent of Police, Raigad-Alibag
Copy- Executive Magistrate Karjat.
Copy- M/s.Tata Power Company Ltd., At.Sr.No.01, Bhivpuri Camp, Tal.Karjat, Dist.Raigad.
Copy- M/s.Tata Project Ltd., At.Sr.No.01, Bhivpuri Camp, Tal.Karjat, Dist.Raigad.
Copy- M/s.Salvo Industries Private Ltd, At.Plot No.17, Sri Malani, Co-op Housing Society, Indian Airlines Colony, Tirumalghery, Secunderabad, Village-Tirumalghery, Dist.Hyderabad, State-Telangana.
Copy- Order File.

(Kishan J. Jawale)
District Magistrate Raigad

HCC Bhivpuri PSP Joint Venture

CORPORATE ENVIRONMENT POLICY

Tata Power reaffirms its commitment to a clean, safe and healthy environment and shall Operate its facilities across the value chain of Generation (Thermal, Hydro, Waste Heat Recovery, Solar, Wind, Hybrid), Transmission, Distribution, and Energy based solutions to customers in an environmentally sensitive and responsible manner.

To achieve the above, Tata Power shall endeavor to:

- Comply and/or exceed all applicable environmental legislation(s).
- Conserve natural resources by improving operational efficiency, reducing wastage(s), preventing pollution, and rational and sustainable use of water and other resources.
- Integrate environmentally sound technologies and best practices for continual improvement in environmental performance by institutionalizing a robust Environment Management System.
- Minimize T & D losses from the distribution process through efficient logistics system operation.
- Proactively assess risks and opportunities and take business decisions to enable sustained environmental performance across all its operations including JVs and Subsidiaries.
- Consider environmental factors in capital investments such as mergers and acquisitions.
- Consider environmental factors while selecting supply chain partners.
- Develop and deliver more efficient and environment-friendly energy-based solutions to customers.
- Integrate the conservation, protection and promotion of biodiversity with the principle of achieving "No net loss of biodiversity".
- Communicate this Policy & Inculcate environmental consciousness amongst all its stakeholders.
- Periodically review this policy for applicability, relevance, effectiveness and congruence with the continuously evolving business environment but not lesser than once in three years.
- This policy is applicable to all establishments of Tata Power and employees.

Date: 7th October 2021

Dr. Praveer Sinha
CEO & MD

TATA POWER
Lighting up Lives!

WWW.INDIANEXPRESS.COM
THE INDIAN EXPRESS, FRIDAY, MAY 23, 2025

IN ENGLISH & MARATHI MEDIUM SCHOOLS

New academic year nears; third language uncertainty persists

Two apprehended after security breach at Salman Khan's house

'Chhatrapati Shivaji Maharaj Circuit' heritage train journey from June 9

Body not found, Thane court acquits two men in 2020 'murder' case

Indian Express Mumbai 23.05.2025

NCP LEADER'S DAUGHTER-IN-LAW FOUND DEAD

Supriya Sule vows justice as NCP (SP) targets Hagawane

Ajit Pawar sends woman NCP leaders to meet victim's parents

NCP (SP) protesters at Bal Gandharva Chowk on Thursday.

FIR against man for threatening Vaishnavi's family

Seven fresh Covid-19 cases

Tempo driver killed as four vehicles crash on old Pune-Mumbai highway

Express Careers

GOKHALE EDUCATION SOCIETY

APPOINTMENTS

Indian Express Pune 23.05.2025

बडीशेप सेवनाने कोलेस्ट्रॉल नियंत्रणात

आरोग्य वार्ता

'हेरिटेज वॉक' पुन्हा सुरू करण्यास मंजुरी

स्थायी समितीमध्ये मुख्य सभेसमोर प्रस्ताव मान्यता

पत्राच्याच्या आमिषाने सव्वा कोटीची फसवणूक

सिंहगड रस्त्यावर हजारो लिटर पाणी वाया

पर्यायी मराठी प्रतिशब्द शोधणे गरजेचे

महापालिकेकडून 'सीओम'ला दररोज १५ लाख लिटर पाणी

स्थायी समितीत प्रस्ताव मान्य

रायगड टाइम्स
नवी मुंबई, पनवेल, उरण परिसर
शुक्रवार, २३ मे २०२५

थोडक्यात

राज्य आदर्श शिक्षक समितीच्या राज्याध्यक्ष पदावर प्रसाद म्हात्रे

माजी नगरसेवकासह चार जणांविरोधात गुन्हा दाखल

संचालक असल्याचे भासवून चॅटिंग; ७५ तासांचा गंडा

कळंबोलीत पाऊसपाण्याचे भय संपणार कधी?

राष्ट्रवादी काँग्रेस शरदचंद्र पवार पक्षाचा सवाल

प्रतिबंधात्मक उपाययोजना करण्याचे मनपाकडून आश्वासन

घोकादायक इमारती तातडीने रिकाम्या करा

पनवेल महापालिका आयुक्त मंगेश चितळे यांनी दिल्या सूचना

पनवेल येथे कारच्या धडकेत पादचाऱ्याचा मृत्यू

भरघोस परताव्याचे आमिष दाखवून एक कोटीची फसवणूक

कामगार नेते संतोष पवार यांच्या निलंबनाच्या निषेधार्थ

आवश्यकता आहे

जाहीर नोटीस

Krushival Marathi 23.05.2025

Annexure 17 Environment Clearance
Submission acknowledgement

Ref: TPC/BHV/2025/PSP-18

Ack

Date: 04.06.2025

To,
The District Collector,
District Collector Office,
Opposite Sassoon Hospital,
Agarkar Nagar Station Road,
District : Pune, 4110 01.

Sub: Grant of Environmental Clearance for Tata Power's Proposed "Bhivpuri Open Loop Pumped Storage Project (1000 MW)" at Village Sawale & Khand, Tal. Maval, Dist. Pune and Village Bhivpuri (Camp), Tal. Karjat, Dist. Raigad, Maharashtra.

Ref.: MoEF&CC letter no. J-12011/39/2023-IA.I (R) dated 19th May 2025

Dear Sir,

In order to harness Green Energy, Tata Power has proposed "**Bhivpuri Open Loop Pumped Storage Project (1000 MW)" at Village Sawale & Khand, Tal. Maval, Dist. Pune and Village Bhivpuri (Camp), Tal. Karjat, Dist. Raigad, Maharashtra.** Ministry of Environment, Forests and Climate Change (MoEF&CC) has accorded Environment Clearance for the proposed project vide letter no. **J-12011/39/2023-IA.I (R) dated 19th May 2025.** A copy of Environment Clearance letter is attached herewith for your ready reference. This is in compliance with clause no. 17 (b) of General Instructions of the EC letter.

This is for your information and record please.

Thanking you,

Yours faithfully,
For The Tata Power Company Limited,

THE TATA POWER CO. LTD. BHIVPURI

(Fulendra Dhurandhar)
Project Head, Bhivpuri PSP.

Enclosure: Environmental Clearance Letter dated 19th May 2025.

CC:

1. **SDO, Maval**
2. **Tahsildar, Maval**
3. **BDO, Maval**
4. **Gram Panchayat, Khand**
5. **Gram Panchayat, Sawale**

TATA

Ref: TPC/BHV/2025/PSP-18

Date: 04.06.2025

To,
The District Collector,
District Collector Office,
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Thanking you,

Yours faithfully,
For The Tata Power Company Limited,

(Fulendra Dhurandhar)
Project Head, Bhivpuri PSP.

THE TATA POWER CO. LTD. BHIVPURI

आवक-जावक विभाग
उपविभागीय ... कार्यालय
मावळ-पुणे विभाग पुणे
दिनांक- 5/6/2025

Enclosure: Environmental Clearance Letter dated 19th May 2025.

CC:
1. **SDO, Maval**
2. **Tahsildar, Maval**
3. **BDO, Maval**
4. **Gram Panchayat, Khand**
5. **Gram Panchayat, Sawale**

TATA

Ref: TPC/BHV/2025/PSP-**18** AEK **Date:** 04.06.2025

To,
The District Collector,
District Collector Office,
Opposite Sassoon Hospital,
Agarkar Nagar Station Road,
District : Pune, 4110 01.

Sub: Grant of Environmental Clearance for Tata Power's Proposed "Bhivpuri Open Loop Pumped Storage Project (1000 MW)" at Village Sawale & Khand, Tal. Maval, Dist. Pune and Village Bhivpuri (Camp), Tal. Karjat, Dist. Raigad, Maharashtra.

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Thanking you,

Yours faithfully,
For The Tata Power Company Limited,

(Fulendra Dhurandhar)
Project Head, Bhivpuri PSP.

THE TATA POWER CO. LTD. BHIVPURI

आवक जावक लिपिक
तहसिल कार्या , मावळ
जि पुणे पीन न-४१२१०६
06 JUN 2025

Enclosure: Environmental Clearance Letter dated 19th May 2025.

CC:

1. **SDO, Maval**
2. **Tahsildar, Maval**
3. **BDO, Maval**
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5. **Gram Panchayat, Sawale**

Ack

Ref: TPC/BHV/2025/PSP-18

Date: 04.06.2025

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(Fulendra Dhurandhar)
Project Head, Bhivpuri PSP.

Enclosure: Environmental Clearance Letter dated 19th May 2025.

CC:

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2. **Tahsildar, Maval**
3. **BDO, Maval**
4. **Gram Panchayat, Khand**
5. **Gram Panchayat, Sawale**

E1E/2025

पंचायत समिती मावळ

TATA

Ref: TPC/BHV/2025/PSP-18

Date: 04.06.2025

To,
The District Collector,
District Collector Office,
Opposite Sassoon Hospital,
Agarkar Nagar Station Road,
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(Fulendra Dhurandhar)
Project Head, Bhivpuri PSP.

Enclosure: Environmental Clearance Letter dated 19th May 2025.

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2. **Tahsildar, Maval**
3. **BDO, Maval**
4. **Gram Panchayat, Khand**
5. **Gram Panchayat, Sawale**

कुंडलिक विठ्ठल निकाळजे
मुख्य ग्रामपंचायत खांड
ता. मावळ, जि. पुणे

TATA

Ref: TPC/BHV/2025/PSP-18

Data: 04.06.2025

To,
The District Collector,
District Collector Office,
Opposite Sassoon Hospital,
Agarkar Nagar Station Road,
District : Pune, 4110 01.

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Ref.: MoEF&CC letter no. J-12011/39/2023-IA.I (R) dated 19th May 2025

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Yours faithfully,
For The Tata Power Company Limited,

(Fulendra Dhurandhar)
Project Head, Bhivpuri PSP.

THE TATA POWER CO. LTD. BHIVPURI

Enclosure: Environmental Clearance Letter dated 19th May 2025.

CC:

1. **SDO, Maval**
2. **Tahsildar, Maval**
3. **BDO, Maval**
4. **Gram Panchayat, Khand**
5. **Gram Panchayat, Sawale**

सौ. मंगल नागू ढोरे
सरपंच
ग्रामपंचायत सावळा
ता. मावळ, जि. पुणे.
9/6/2025

TATA

Ark.

Ref: TPC/BHV/2025/PSP-**19** **Date:** 04.06.2025

To,
The Tehsildar,
Tehsildar Office, Karjat
Dist.: Raigad,
PIN – 412 201

Sub: Grant of Environmental Clearance for Tata Power's Proposed "Bhivpuri Open Loop Pumped Storage Project (1000 MW)" at Village Bhivpuri (Camp), Taluka Karjat, District Raigard, Maharashtra.

Ref.: MoEF&CC letter no. J-12011/39/2023-IA.I (R) dated 19th May 2025

Dear Sir,

In order to harness Green Energy, Tata Power has proposed **"Bhivpuri Open Loop Pumped Storage Project (1000 MW)" at Village Bhivpuri (Camp), Taluka Karjat, District Raigard, Maharashtra.** Ministry of Environment, Forests and Climate Change (MoEF&CC) has accorded Environment Clearance for the proposed project vide letter no. **J-12011/39/2023-IA.I (R) dated 19th May 2025.** A copy of Environment Clearance letter is attached herewith for your ready reference. This is in compliance with clause no. 17 (b) of General Instructions of the EC letter.

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Thanking you,

For The Tata Power Company Limited,

(Fulendra Dhurandhar)
Project Head, Bhivpuri PSP

THE TATA POWER CO. LTD. BHIVPURI

Enclosure: Environmental Clearance Letter dated 19th May 2025.

CC:

1. SDO, Karjat
2. BDO, Karjat
3. Gram Panchayat, Bhivpuri.

महसुल सहायक
तहसिल कर्जत, रायगड
04 JUN 2025

TATA

Ack

Ref: TPC/BHV/2025/PSP-19 **Date:** 04.06.2025

To,
The Tehsildar,
Tehsildar Office, Karjat
Dist.: Raigad,
PIN – 412 201

Sub: Grant of Environmental Clearance for Tata Power's Proposed "Bhivpuri Open Loop Pumped Storage Project (1000 MW)" at Village Bhivpuri (Camp), Taluka Karjat, District Raigard, Maharashtra.

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For The Tata Power Company Limited,

(Fulendra Dhurandhar)
Project Head, Bhivpuri PSP

TATA POWER CO. LTD. BHIVPURI

Enclosure: Environmental Clearance Letter dated 19th May 2025.

CC:
1. SDO, Karjat
2. BDO, Karjat
3. Gram Panchayat, Bhivpuri.

महसूल विभाग
उपविभागीय अधिकारी
कर्जत उपविभाग, कर्जत
4/6/2025

Ack.

Ref: TPC/BHV/2025/PSP-19

Date: 04.06.2025

To,
The Tehsildar,
Tehsildar Office, Karjat
Dist.: Raigad,
PIN – 412 201

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For The Tata Power Company Limited,

(Fulendra Dhurandhar)
Project Head, Bhivpuri PSP

THE TATA POWER CO. LTD. BHIVPURI

Enclosure: Environmental Clearance Letter dated 19th May 2025.

CC:

1. SDO, Karjat
2. BDO, Karjat
3. Gram Panchayat, Bhivpuri.

05/06/2025
तेसलिक
पंचायत समिती कर्जत

TATA

Ref: TPC/BHV/2025/PSP-19 **Date:** 04.06.2025

To,
The Tehsildar,
Tehsildar Office, Karjat
Dist.: Raigad,
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THE TATA POWER CO. LTD. BHIVPURI

(Fulendra Dhurandhar)
Project Head, Bhivpuri PSP

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CC:
1. SDO, Karjat
2. BDO, Karjat
3. Gram Panchayat, Bhivpuri.

ग्रुप ग्रामपंचायत भिवपुरी स्थापना ता. कर्जत जि. रायगड

RM101213217IN IVR:827710121321 7
RL KHOPOLI S.O <410203>
Counter No:1,13/06/2025,10:04
To:MINISTRY OF E,ZONAL OFFICE WES
PIN:440001, Nagpur GPO
From:YASH D GOWD,PROJECT DEVELOPM
Wt:80gms,REG=17.0
Amt:43.66,Tax:6.66,Amt.Paid:44.00(Cash)
<Track on www.indiapost.gov.in>
<Dial 18002666868><Wear mask -Stay safe>

Ref: TPC/BHV/2025/PSP-**20**

Date: 10.06.2025

To,
Ministry of Environment, Forest &
Climate Change, Zonal Office,
Western-Central Zone,
New Secretariat Building, Ground Floor,
East Wing, Civil Line, Nagpur – 440 001.

Sub: Grant of Environmental Clearance for Tata Power's Proposed "Bhivpuri Open Loop Pumped Storage Project (1000 MW)" at Village Sawale & Khand, Tal. Maval, Dist. Pune and Village Bhivpuri (Camp), Tal. Karjat, Dist. Raigad, Maharashtra.

Ref.: MoEF&CC letter no. J-12011/39/2023-IA.I (R) dated 19th May 2025

Dear Sir,

In order to harness Green Energy, Tata Power has proposed "**Bhivpuri Open Loop Pumped Storage Project (1000 MW)" at Village Sawale & Khand, Tal. Maval, Dist. Pune and Village Bhivpuri (Camp), Tal. Karjat, Dist. Raigad, Maharashtra.** Ministry of Environment, Forests and Climate Change (MoEF&CC) has accorded Environment Clearance for the proposed project vide letter no. **J-12011/39/2023-IA.I (R) dated 19th May 2025.** A copy of Environment Clearance letter is attached herewith for your ready reference. This is in compliance with clause no. 17 (b) of General Instructions of the EC letter.

This is for your information and record please.

Thanking you,

Yours faithfully,
For The Tata Power Company Limited,

THE TATA POWER CO. LTD. BHIVPURI

(Fulendra Dhurandhar)
Project Head, Bhivpuri PSP.

Enclosure: Environmental Clearance Letter dated 19th May 2025.

Ref: TPC/BHV/2025/PSP-22

Date: 18.06.2025

To,
Government of Maharashtra,
New Administrative Building,
15th Floor, Mantralaya,
Madam Cama Road, Mumbai – 400 032

Sub: Grant of Environmental Clearance for Tata Power's Proposed "Bhivpuri Open Loop Pumped Storage Project (1000 MW)" at Village Sawale & Khand, Tal. Maval, Dist. Pune and Village Bhivpuri (Camp), Tal. Karjat, Dist. Raigad, Maharashtra.

Ref.: MoEF&CC letter no. J-12011/39/2023-IA.I (R) dated 19th May 2025

Dear Sir,

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For The Tata Power Company Limited,

THE TATA POWER CO. LTD. BHIVPURI

(Fulendra Dhurandhar)
Project Head, Bhivpuri PSP.

Enclosure: Environmental Clearance Letter dated 19th May 2025.

P.A. Bhagwat
19-06-2025
लिपिक/तां.क.:--
पर्यावरण व वातावरणीय बदल विभाग
मंत्रालय, मुंबई ४०० ०३२

Ref: TPC/BHV/2025/PSP-**22**

Date: 18.06.2025

To,
Government of Maharashtra,
New Administrative Building,
15th Floor, Mantralaya,
Madam Cama Road, Mumbai – 400 032

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Ref.: MoEF&CC letter no. J-12011/39/2023-IA.I (R) dated 19th May 2025

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Yours faithfully,
For The Tata Power Company Limited,

THE TATA POWER CO. LTD. BHIVPURI

(Fulendra Dhurandhar)
Project Head, Bhivpuri PSP.

Enclosure: Environmental Clearance Letter dated 19th May 2025.

Ref: TPC/BHV/2025/PSP-**15** **Date:** 21.05.2025

To,
The Member Secretary,
Maharashtra Pollution Control Board
Kalpataru Point, 3rd & 4th floor
Opp. Cine Planet, Near Sion Circle, Sion (E)
Mumbai - 400 022

Sub: Commencement of Project Site Activities for Tata Power's 1000 MW Bhivpuri Open Loop Pumped Storage Project at Village Bhivpuri (camp), Tal: Karjat, Dist: Raigad, Maharashtra.

Ref: Consent to Establish granted by the Board vide letter no. Format1.0/CAC/UAN/0000223630/CE/2501001061 dated 13/01/2025.

Dear Sir,

With reference to the above subject, the MPC Board has granted Consent to Establish for Tata Power's Proposed 1000 MW Bhivpuri Pump Storage Project (PSP) at Village Bhivpuri, Tal: Karjat, Dist: Raigad with a condition of obtaining Prior Environmental Clearance from MoEF&CC before commencement of the project activity.

We are pleased to inform you that MOEF&CC has now accorded Environmental Clearance for the said project vide file no. J-12011/39/2023-IA.I (R) dated 19/05/2025, a copy of which is enclosed herewith for your ready reference.

The project is in advanced stage of implementation with award of first phase of Civil and Hydo-Mechanical Package to Tata Projects and HCC JV. With the receipt of Environmental Clearance and Consent to Establish, we will be commencing all the project activity at site as per the plan. All the activities will be carried out following due Environmental Safeguards as stipulated in Consent to Establish as well as in Environmental Clearance granted for the Bhivpuri PSP Project.

This is for your information and record please.

Thanking you,

Yours faithfully,
For The Tata Power Company Ltd.,

for **Kumar Pritam**
Chief – Hydro Projects

THE TATA POWER CO. LTD. BHIVPURI

Enclosed: Copy of EC granted by MOEF&CC dated 19/05/2025.

CC: 1) RO, MPCB, Raigad for information.
2) RO, MPCB, Pune for information.

22/05/25

महाराष्ट्र प्रदूषण नियंत्रण मंडळ
कल्पतरु पॉईंट, २ रा मजला, सायन सर्कल,
सिनेप्लॅनेट समोर, सायन (पूर्व),
मुंबई - ४०० ०२२.
फोन :-२४०१०४३७ / २४०२०७८१.
Website www.mpcb.gov.in

Ref: TPC/BHV/2025/PSP-**15** **Date:** 21.05.2025

To,
The Member Secretary,
Maharashtra Pollution Control Board
Kalpataru Point, 3rd & 4th floor
Opp. Cine Planet, Near Sion Circle, Sion (E)
Mumbai - 400 022

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Yours faithfully,
For The Tata Power Company Ltd.,

for **Kumar Pritam**
Chief – Hydro Projects

THE TATA POWER CO. LTD. BHIVPURI

Enclosed: Copy of EC granted by MOEF&CC dated 19/05/2025.

22.05.2025
प्रादेशिक कार्यालय, रायगड, नवी मुंबई
म.प्र.नि. मंडळ, रायगड भवन, ६ वा माळा,
सी.बी.डी. बेलापूर, नवी मुंबई - ४००६१४

CC: 1) RO, MPCB, Raigad for information.
2) RO, MPCB, Pune for information.

OC

TATA

Ref: TPC/BHV/2025/PSP-**15**

Date: 21.05.2025

To,
The Member Secretary,
Maharashtra Pollution Control Board
Kalpataru Point, 3rd & 4th floor
Opp. Cine Planet, Near Sion Circle, Sion (E)
Mumbai - 400 022

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This is for your information and record please.

Thanking you,

Yours faithfully,
For The Tata Power Company Ltd.,

for **Kumar Pritam**
Chief – Hydro Projects

THE TATA POWER CO. LTD. BHIVPURI

Received on Dt. 22/05/2025
R. O. M. P. C. B. Pune

Enclosed: Copy of EC granted by MOEF&CC dated 19/05/2025.

CC: 1) RO, MPCB, Raigad for information.
2) RO, MPCB, Pune for information.