EXECUTIVE SUMMARY OF DRAFT EIA REPORT

Lara Super Thermal Power Project Stage-III (2×800 MW) at VillagesArmuda, Chhapora, Bodajhariya, Mahloi, Riyapalli, Kandagarh. Devalpura, Ghutkupali, Thengapali, Lara in Tehsil Pussore, District Raigarh and Village Saradih in Tehsil Dabhara, District Sakti, Chhattisgarh

PROJECT PROPONENT

NTPC LIMITED

(A Government of India Enterprise)

Details	Remark
ToR Application Submitted	28/06/2025
The proposal was considered	28th EAC meeting held on 12-13th August, 2025
ToR Granted	vide TOR Identification No. TO25A0601CG5405931N and File No. J-13012/11/2018-IA.I (T) dated 09.09.2025
Baseline Study Period	March 2025 to May 2025

QCI NABET Certification No.: NABET/EIA/24-27/RA 0343
Validity up to 05/02/2027
Behind DIC Office, Agriculture College Campus, Shivajinagar, Pune - 411005, Maharashtra (INDIA)

Environment Consultant & Laboratory

MITCON Consultancy & Engineering Services Limited., Pune

EME/CS/NTPC/2024-25/15 Dated 30.01.2026

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Executive Summary

1.1 Introduction

NTPC Limited, a Maharatna Public Sector Enterprise of the Government of India, is the country's largest integrated Power generation company with a diversified portfolio encompassing Coal, Gas, Hydro, Solar, Wind and emerging clean energy technologies. Aligned with its vision of sustainable and Reliable Power supply, NTPC is committed to expanding capacity while integrating Environmental stewardship and social responsibility. Presently, NTPC Group is operating power Projects of coal, gas, solar, hydro and wind, with an installed capacity of 85,975 MW and around 33,510.97 MW under construction across various locations in the country as on 29.01.2026.

As part of this strategy, NTPC proposes Stage-III expansion of the existing Lara Super Thermal Power Project (Lara STPP) by the addition of 2 × 800 MW units, enhancing the total installed capacity from 3200 MW to 4800 MW. The Proposed Expansion will be implemented within the existing Project infrastructure, available vacant land with proposed acquigision of additional land of 225.66 Ha (Pvt:212.32 ha, Govt:1.99 ha & Forest:11.35 ha) for Ash Dyke, Ash Pipe & Road Corridor, and Green belt corridor. This ensuring optimal utilization of land resources, with the adoption of Ultra Supercritical Technology, Robust pollution control systems, and compliance with statutory Environmental norms, the Project will contribute significantly to meeting regional and National Power demand while maintaining Environmental safeguards and supporting Socio-economic development of the surrounding region.

1.2 Purpose of the Report

The purpose of this Environmental Impact Assessment (EIA) report is to assess the potential Environmental impacts associated with the proposed Lara Super Thermal Power Project (STPP) Stage-III (2×800 MW) and to provide suitable mitigation measures.

As per Environmental Impact Assessment (EIA) Notification dated 14th September 2006, commissioning or operation of thermal Power Plants (≥500 MW) falls under category 'A' under Project type-1(d) and requires prior Environmental Clearance (EC) to be obtained from MoEF & CC before the commencement of construction activities.

In line with the aforesaid notification, online TOR application for the Project was submitted to MOEF&CC on PARIVESH vide proposal no. IA/CG/THE/543085/2025

dated 28.06.2025. The proposal was considered in 28th EAC meeting held on 12-13th August, 2025, and it was recommended for the grant of TOR. MoM of EAC (Thermal) Meeting vide MoM ID: EC/MOM/EAC/782911/7/2025 dated 26.08.2025 was uploaded on PARIVESH. MOEF&CC has accorded TOR vide TOR Identification No. TO25A0601CG5405931N and File No. J-13012/11/2018-IA.I (T) dated 09.09.2025**.** Which is valid for four years, i.e., up to 08.09.2029. This report is prepared and based on the approved TOR conditions received from MoEF&CC and their compliance with the TOR conditions.

The report aims to:

- Facilitate appraisal of the Project by the Ministry of Environment, Forest and Climate Change (MoEF&CC) in accordance with the EIA Notification 2006 and its amendments**.**
- Ensure that Project planning and implementation comply with applicable Environmental regulations and safeguard standards.
- Provide a framework for mitigation of Environmental impacts during construction and operation phases.
- Support decision-making for Environmental Clearance (EC) by presenting scientifically derived baseline data, predictive impact assessments, and mitigation measures.

The proposed Stage-III expansion will increase the overall generation capacity of the Lara Super Thermal Power Station from 3200 MW (Stage-I and Stage-II) to 4800 MW, through the addition of two Ultra Supercritical Units of 800 MW each. Implementation of Stage-III will not only strengthen NTPC's position as a leading Power producer but will also meet the increasing electricity demand in the Western Region and neighbouring states. The Project is expected to generate additional revenue through efficient use of existing infrastructure and will contribute to India's broader goal of ensuring reliable, affordable, and cleaner Power for all.

Accordingly, this EIA report:

- Establish the baseline Environmental attributes i.e., Air, water, soil, noise, flora & fauna, socio-economic status, etc., in a 10 km study area;

- Evaluates the likely impacts of the proposed expansion of the Project on Environmental components such as Air, Water, Land, Noise, Ecology, Traffic and Socio-economic conditions.
- Recommends suitable mitigation measures to avoid, minimize, or manage the identified impacts; and
- Presents an Environmental Management Plan (EMP) outlining implementation mechanisms, monitoring programs, and institutional responsibilities to ensure compliance with Environmental standards throughout the life cycle of the Project.

1.3 Environmental Setting

The Environmental setting of the Project is given in **Table-1.1.** The Project site's relation to surrounding features, transport networks, and administrative boundaries is shown in the Toposheet Map of the 10 km study area in **Figure 1.1.**

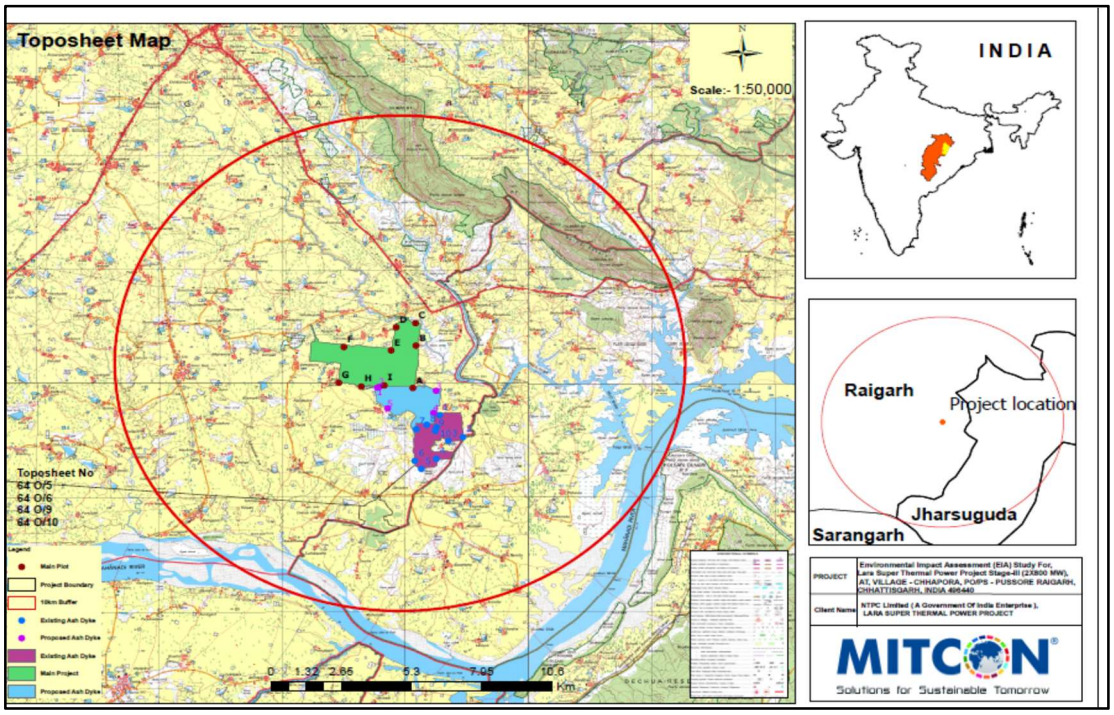

Figure 1.1 Study Area Map (10 km Radius)

Table 1.1 Environmental Setting – 10 Km Ra

<table>
<tr><th>Sr. No.</th><th>Particulars</th><th>Details</th></tr>
<tr><td colspan="3">Location</td></tr>
<tr><td>1</td><td>Co-ordinates</td><td>
Main Plant
<table>
<tr><th>Point</th><th>Latitude</th><th>Longitude</th></tr>
<tr><td>A</td><td>21°44'54.27"N</td><td>83°27'38.88"E</td></tr>
<tr><td>B</td><td>21°45'49.88"N</td><td>83°27'42.64"E</td></tr>
<tr><td>C</td><td>21°46'19.41"N</td><td>83°27'42.09"E</td></tr>
<tr><td>D</td><td>21°46'13.99"N</td><td>83°27'18.53"E</td></tr>
<tr><td>E</td><td>21°45'43.61"N</td><td>83°27'12.29"E</td></tr>
<tr><td>F</td><td>21°45'48.05"N</td><td>83°26'14.69"E</td></tr>
<tr><td>G</td><td>21°45'1.07"N</td><td>83°26'8.51"E</td></tr>
<tr><td>H</td><td>21°44'56.15"N</td><td>83°26'35.99"E</td></tr>
<tr><td>I</td><td>21°44'57.73"N</td><td>83°27'3.94"E</td></tr>
</table>
Township
<table>
<tr><th>Point</th><th>Latitude</th><th>Longitude</th></tr>
<tr><td>1</td><td>21°45'48.83"N</td><td>83°26'13.46"E</td></tr>
<tr><td>2</td><td>21°45'52.00"N</td><td>83°25'36.04"E</td></tr>
<tr><td>3</td><td>21°45'30.34"N</td><td>83°25'34.04"E</td></tr>
<tr><td>4</td><td>21°45'27.42"N</td><td>83°26'11.50"E</td></tr>
</table>
Existing Ash Dyke
<table>
<tr><th>Point</th><th>Latitude</th><th>Longitude</th></tr>
<tr><td>1</td><td>21°44'18.70"N</td><td>83°28'11.66"E</td></tr>
<tr><td>2</td><td>21°43'49.80"N</td><td>83°28'40.03"E</td></tr>
<tr><td>3</td><td>21°43'44.81"N</td><td>83°28'22.30"E</td></tr>
<tr><td>4</td><td>21°43'21.20"N</td><td>83°28'7.52"E</td></tr>
<tr><td>5</td><td>21°43'8.09" N</td><td>83°27'49.20"E</td></tr>
<tr><td>6</td><td>21°43'18.64"N</td><td>83°27'41.19"E</td></tr>
<tr><td>7</td><td>21°44'0.21"N</td><td>83°27'43.05"E</td></tr>
<tr><td>8</td><td>21°44'6.12"N</td><td>83°27'55.90"E</td></tr>
<tr><td>9</td><td>21°43'58.06"N</td><td>83°28'6.16"E</td></tr>
<tr><td>10</td><td>21°44'2.68"N</td><td>83°28'7.74"E</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>Sr. No.</th><th>Particulars</th><th>Details</th></tr>
<tr><td></td><td></td><td>Proposed Ash Dyke
<table>
<tr><th>Point</th><th>Latitude</th><th>Longitude</th></tr>
<tr><td>1</td><td>21°44'54.73"N</td><td>83°26'55.54"E</td></tr>
<tr><td>2</td><td>21°44'55.69"N</td><td>83°26'57.80"E</td></tr>
<tr><td>3</td><td>21°44'50.75"N</td><td>83°28'07.29"E</td></tr>
<tr><td>4</td><td>21°44'21.48"N</td><td>83°28'04.06"E</td></tr>
<tr><td>5</td><td>21°44'27.51"N</td><td>83°27'08.08"E</td></tr>
</table></td></tr>
<tr><td rowspan="4">2</td><td rowspan="4">Elevation</td><td>Main Plant-219m-235m</td></tr>
<tr><td>Township-221m-234m</td></tr>
<tr><td>Existing Ash Dyke-219m-244m</td></tr>
<tr><td>Proposed Ash Dyke-219m-233m</td></tr>
<tr><td rowspan="2">3</td><td rowspan="2">Land Details</td><td>Under Possession: 1039.09Ha</td></tr>
<tr><td>A total of 1268.77 Ha of land has been identified for the Main Plant, Township, Ash Dyke and Ancillary Facilities of Lara STPP. Out of the above land, about 1039.09 Ha of land was acquired & 4.02 Ha of land is under the land acquisition process. In addition to the above 225.66 Ha of land shall be acquired (Pvt:212.32 ha, Govt:1.99 ha & Forest:11.35 ha) for Ash Dyke, Ash Pipe & Road Corridor and Green belt.

Lara STPP Stage-I: 678.68 Ha (Under operation)
Lara STPP Stage-II: 254.27 Ha (Under construction)
Lara STPP Stage-III:335.82 Ha (Shall be developed)

(Govt Land of 40.89 ha was handed over to the respective village as CPR Land).</td></tr>
</table>

<table>
<tr><th>Sr. No.</th><th>Particulars</th><th>Details</th></tr>
<tr><td>4</td><td>Existence of Habitation/Village</td><td>Project site: No habitation
Study Area:
<table>
<tr><th>Habitation</th><th>Distance</th><th>Direction</th></tr>
<tr><td>Lohakhan</td><td>0.25 Km</td><td>N</td></tr>
<tr><td>Chhapora</td><td>0.3 Km</td><td>W</td></tr>
<tr><td>Mehloi</td><td>0.5 Km</td><td>NW</td></tr>
<tr><td>Dewalsura</td><td>0.5 Km</td><td>W</td></tr>
<tr><td>Charpali</td><td>1.5 Km</td><td>E</td></tr>
<tr><td>Rengalpali</td><td>1.30 Km</td><td>NE</td></tr>
<tr><td>Darripali</td><td>1.68 Km</td><td>W</td></tr>
<tr><td>Ghutakupali</td><td>1.83 Km</td><td>NW</td></tr>
<tr><td>Kodpali</td><td>1.88 Km</td><td>SW</td></tr>
<tr><td>Thengapali</td><td>1.91 Km</td><td>N</td></tr>
<tr><td>Pussore</td><td>6.5 Km</td><td>W</td></tr>
</table></td></tr>
<tr><td>5</td><td>Existence of School</td><td>Project site: Gurukul International
Study Area:
<table>
<tr><th>School</th><th>Distance</th><th>Direction</th></tr>
<tr><td>Deolsura</td><td>0.5Km</td><td>W</td></tr>
<tr><td>Riyapali</td><td>0.5Km</td><td>N</td></tr>
<tr><td>Kasaipali</td><td>0.6Km</td><td>N</td></tr>
<tr><td>Chhapora</td><td>0.5Km</td><td>N</td></tr>
<tr><td>Mehloi</td><td>0.7Km</td><td>NW</td></tr>
<tr><td>Bodajhariya</td><td>0.38Km</td><td>E</td></tr>
<tr><td>Netnagar</td><td>2.1Km</td><td>NE</td></tr>
</table></td></tr>
<tr><td>6</td><td>Existence of Hospitals</td><td>Project site: NTPC Stabilization centre, Lara
Study Area:
<table>
<tr><th>PHC/ Sub Health Center (Hospital)</th><th>Distance</th><th>Direction</th></tr>
<tr><td>Deolsura-PHC</td><td>0.5 km</td><td>W</td></tr>
<tr><td>Nawapara-SHC</td><td>1.35 km</td><td>N</td></tr>
<tr><td>Kathani-SHC</td><td>1.96 km</td><td>W</td></tr>
<tr><td>Rengalpali-SHC</td><td>1.40 km</td><td>E</td></tr>
<tr><td>Netnagar-SHC</td><td>1.7 km</td><td>NE</td></tr>
<tr><td>Muralipali-SHC</td><td>2.45 km</td><td>S</td></tr>
<tr><td>Badehaldi-SHC</td><td>3.96 km</td><td>N</td></tr>
</table></td></tr>
</table>

<table>
<tr><th>Sr. No.</th><th>Particulars</th><th>Details</th></tr>
<tr><td>7</td><td>Existence of Water bodies</td><td>Project site: No Water Body
Study area
<table>
<tr><th>Water body</th><th>Distance</th><th>Direction</th></tr>
<tr><td>Nala Near Chhapora Village</td><td>0.05 Km</td><td>N</td></tr>
<tr><td>Kelo River</td><td>0.7 Km</td><td>E</td></tr>
<tr><td>Mahandi River</td><td>2.2 Km</td><td>S</td></tr>
<tr><td>Basanpali Pond</td><td>1.50 Km</td><td>WS</td></tr>
<tr><td>Kevra Pond</td><td>0.77 Km</td><td>W</td></tr>
<tr><td>Chhapora Lake</td><td>0.67 Km</td><td>W</td></tr>
<tr><td>Hirakud reservoir</td><td>12.0 Km</td><td>E</td></tr>
</table></td></tr>
<tr><td>8</td><td>HFL & Distance from River</td><td>The plant site (219-235m elevation) is present at a higher elevation than the HFL (196.33 m MSL) of the Kelo river, ensuring no risk of flooding.
Based on the Temporary Bench Mark (TBM) reference, the HFL of 100.60 m corresponds to 196.33 m above Mean Sea Level (MSL). The said location is situated at an approximate distance of 2.25 km from the plant site. On the basis of the above data, the HFL of the concerned water body is confirmed as 196.33 m MSL.</td></tr>
<tr><td>9</td><td>Nearest Highway</td><td>National Highway– Raigarh Road NH-49 (Jharshuguda) (0.7 km, NE) and State Highway SH-16 (Sakti Malkharoda - Chhapora Road) (0.35 km N)</td></tr>
<tr><td>10</td><td>Nearest Railway Station</td><td>Raigarh (14.5 km, NNW)</td></tr>
<tr><td>11</td><td>Nearest Airport</td><td>Jharsuguda (80 km, E)</td></tr>
<tr><td>12</td><td>Nearest town/City</td><td>Raigarh (About 20 Km)</td></tr>
<tr><td>13</td><td>Archaeologically Site</td><td>None within a 10 km radius</td></tr>
<tr><td>14</td><td>National Parks / Wildlife sanctuaries/ Corridors / Reserved forest</td><td>Nil within a 10 km radius study area
Debrigarh sanctuary (18.6 km, SE)</td></tr>
<tr><td>15</td><td>State/National boundaries</td><td>Chhattisgarh-Odisha (1.5 km, East) from Mian Plant & 0.10 km from Ash Dyke</td></tr>
<tr><td>16</td><td>Defence Installations</td><td>None within a 10 km radius</td></tr>
</table>

<table>
<tr><th>Sr. No.</th><th>Particulars</th><th>Details</th></tr>
<tr><td>17</td><td>Nearest Non-Attainment City</td><td>The nearest non-attainment city is Korba, which is 99 Km from NTPC Lara.
<table>
<tr><th>City</th><th>Aerial distance from NTPC Lara</th><th>City</th><th>Aerial distance from NTPC Lara</th><th>City</th><th>Aerial distance from NTPC Lara</th></tr>
<tr><td>Korba</td><td>98.9 Km</td><td>Talcher</td><td>203.15 Km</td><td>Cuttack</td><td>290 Km</td></tr>
<tr><td>Bhilai</td><td>227.07 Km</td><td>Angul</td><td>198 Km</td><td>Rourkela</td><td>154 Km</td></tr>
<tr><td>Raipur</td><td>197.44Km</td><td>Bhubaneshwar</td><td>294.4 Km</td><td></td><td></td></tr>
</table></td></tr>
</table>

1.4 Brief Description of Project

The existing Lara Super Thermal Power Project (STPP), located in Raigarh & Sakti District of Chhattisgarh, is a coal-based Power station owned and operated by NTPC Limited. The Project has been developed in phases to meet growing Power demand in the Western Region and to ensure efficient utilization of available resources.

The station currently comprises two stages —

- Stage-I (2×800 MW): Both units are Operational.
- Stage-II (2×800 MW): Both units are under Construction.

The proposed Stage-III expansion involves the installation of two additional units of 800 MW each, adopting Ultra-supercritical technology and an Air-Cooled Condenser (ACC) system. The expansion will increase the total installed capacity of the Lara Power Station from 3200 MW to 4800 MW, which will make it the largest single-location thermal power plant in India with an installed capacity of 4800 MW and thereby enhancing generation capability and efficiency.

Each 800 MW unit under Stage-III will consist of the following major components:

- **Steam Generator (SG):** Ultra Supercritical, once-through, pulverized coal-fired boiler with single reheat system.
- **Steam Turbine Generator (STG):** Tandem compound, three-cylinder (HP-IP-LP) steam turbine with directly coupled generator.
- **Air Cooled Condenser (ACC):** To minimize water consumption and enhance Environmental performance.

- **Auxiliary Systems:** Coal handling and storage facilities, fuel oil system, Ash handling system, electrical switchyard (765 kV), control and instrumentation systems, and water treatment facilities.

The Project will operate primarily in base-load mode, with the flexibility to operate in cyclic or two-three-shift modes depending on grid demand. The use of high-efficiency ultra supercritical boilers, advanced pollution control systems, and optimized resource utilization will ensure that the Project achieves higher energy output per unit of coal with lower emissions and cost of generation. Construction of Stage-III will include activities such as boundary demarcation, site preparation, development of temporary construction facilities, erection of main Plant structures, installation of balance-of-Plant systems, and integration with the existing station infrastructure, including the switchyard and water intake system.

A brief Description of the nature and size of the proposed Lara STPP Stage-III (2 × 800 MW) expansion Project is summarised in **Table 1.2 below.**

Table 1.2 Brief Description of the Nature and Size of the Project

Sr. No	Item	Details
1.	Name of the Project	Lara Super Thermal Power Project Stage-III (2×800 MW) at Villages Armuda, Chhapora, Bodajhariya, Mahloi, Riyapalli, Kandagarh, Devalpura, Ghutkupali, Thengapali, Lara in Tehsil Pussore, District Raigarh and Village Saradih in Tehsil Dabhara, District Sakti, Chhattisgarh
2.	Project Location	Chhattisgarh
3.	Project Proponent	NTPC Limited
4.	Registered Address	NTPC Bhawan, SCOPE Complex 7, Institutional Area, Lodi Road New Delhi - 110003
5.	Project Site Address	NTPC Lara STPP, Village Lara, P.O. Pussore, District Raigarh, Chhattisgarh – 496440

Sr. No	Item	Details
6.	Category of Project i.e. 'A' or 'B'	Category 'A'
7.	Sl. No. in the schedule	1 (d) – Thermal Power Plants
8.	Capacity	Existing Stage-I: 1600 MW (2 × 800 MW)-Operational Exiting Stage-II: 1600 MW (2 × 800 MW)- Under Construction Proposed Stage-III: 1600 MW (2 × 800 MW)- Proposed Total: 4800 MW
9.	Type of Proposal	Expansion
10.	Violation Case	No
11.	Does it attract the general condition If yes, please specify	Yes (as Project site is within 10 km of interstate boundary)
12.	Authorized Contact Person	Rajesh Malik, AGM & Group Head (CC-Environment Engineering) Room No: 05, 2nd Floor, Engineering Office Complex (EOC) Plot No.- A-8A, Sector-24, Noida – 201301 E-mail: rajeshmalik@ntpc.co.in

A Memorandum of Understanding (MOU) was signed between NTPC Limited and Govt. of Chhattisgarh on 12.07.2009 to establish a 4000 MW (5x800 MW) coal-based Power Project near Lara village in Raigarh Distt. of Chhattisgarh. Lara Super Thermal Power Project (STPP), Stage-I (2x800 MW) units are in commercial operation, Unit-I since 1st Oct 2019, and Unit-II since 7th Nov 2020, and Stage-II (2x800 MW) Units are under construction. The present proposal is for Expansion of Lara Super Thermal

Power Project from 3200 MW [Stage-I (2x800 MW) & Stage-II (2x800 MW)] to 4800 MW by adding two units of 800 MW under Lara Super Thermal Power Project, Stage-III (2x800 MW) with Ultra Super Critical Technology and Air-Cooled Condenser as a regional Power Project for the benefit of States and UTs of Western Region. The ultimate capacity of this Project will be 4800 MW after the implementation of the Stage-III. The salient features of the proposed expansion of STPP are given in following **Table 1.3**.

Table 1.3 Salient Features of the Project

<table>
<tr><th>Sr. No.</th><th>Particulars</th><th>Details</th></tr>
<tr><td>1</td><td>Stage- I
Stage- II
Stage- III</td><td>2 x 800 MW (In operation)
2 x 800 MW (Under Construction)
2 x 800 MW (Present proposal)</td></tr>
<tr><td>2</td><td>Technology</td><td>Ultra Super Critical Technology</td></tr>
<tr><td>3</td><td>Total area of the Plant</td><td>A total of 1227.88 Ha of land has been identified for Main Plant, Township, Ash Dyke and Ancillary Facilities of Lara STPP.
Out of above land, about 1039.09 Ha of land was acquired & 4.02 Ha land is in under land acquisition process. In addition to above 225.66 Ha of land shall be acquired for Ash Dyke, Ash Pipe & Road Corridor and Green belt corridor.
Lara STPP Stage-I: 637.79 Ha (Under Operation)
Lara STPP Stage-II: 254.27 Ha (Under construction)
Lara STPP Stage-III: 335.82 Ha (Proposed)</td></tr>
<tr><td>4</td><td>Ash generation in Tons per Annum (TPA)</td><td><table><tr><th></th><th>Present</th><th>Proposed</th><th>Upon Expansion</th></tr><tr><td>Total Ash</td><td>6612896</td><td>3730000</td><td>10342896</td></tr></table></td></tr>
<tr><td>5</td><td>Water requirement in KLD
Source : Saradih Barrage on Mahanadi River</td><td><table><tr><th>Details</th><th>Present</th><th>Proposed</th><th>Upon Expansion</th></tr><tr><td>Construction Stage</td><td>800</td><td>915</td><td>1715</td></tr></table>Operational Phase:
Lara-I (2 x 800 MW): 4830 m^3/hr (115920 KLD),
Lara-II (2 x 800 MW): 4800 m^3/hr (115200 KLD),</td></tr>
</table>

<table>
<tr><th>Sr. No.</th><th>Particulars</th><th>Details</th></tr>
<tr><td></td><td></td><td>Lara-III (2 x 800 MW): 1600 m^3/hr (38,400 KLD)
Total: 11230 m^3/hr (2,69,520 KLD)
Water Resource Department (WRD), Government of Chhattisgarh have accorded water availability confirmation of 45 MCM (5137 m^3/hr) for stage-I (2x800 MW) Power Project and 68 MCM (7763 m^3/hr) for stage-II for Lara STPP from Saradih barrage on river Mahanadi. Water Requirement of Stage-III shall be meet from existing allocation of Water for Stage-I & II.</td></tr>
<tr><td>6</td><td>Power evacuation
(100 Km)</td><td>The step-up/Power evacuation voltage for stage-III has been considered at 765 kV.</td></tr>
<tr><td>7</td><td>Power Requirement(Stage-III)</td><td>116 MW from Self Generation of Lara Stage-III</td></tr>
<tr><td>8</td><td>Firefighting system</td><td>Adequate firefighting systems as per the Tariff Advisory Committee (TAC) and OISD guidelines will be provided</td></tr>
<tr><td>9</td><td>Cooling System</td><td>Stage-I (2 x 800 MW) : Water Cooled Condenser
Stage-II (2 x 800 MW): Water Cooled Condenser
Stage-III (2 x 800 MW): Air Cooled Condenser</td></tr>
<tr><td>10</td><td>Air Pollution Control</td><td>One Stack -Twin Flue or Two Stack- Single Flue,
Stack Height - 275 m with ESP, NOx Control System,
Dust Extraction & Dust Suppression System, Greenbelt</td></tr>
<tr><td>11</td><td>Land Requirement (in Ha) of the Project or activity</td><td>
<table>
<tr><th>Details</th><th>Present</th><th>Proposed</th><th>Upon Expansion</th></tr>
<tr><td>Non-Forest Land</td><td>740.30</td><td>324.47</td><td>1064.77</td></tr>
<tr><td>Forest Land</td><td>151.76</td><td>11.35</td><td>163.11</td></tr>
<tr><td>Total</td><td>892.06</td><td>335.82</td><td>1227.88</td></tr>
</table>
</td></tr>
<tr><td>12</td><td>Man Power Requirement</td><td>
<table>
<tr><th>Phase</th><th>Present</th><th>Proposed</th><th>Upon Expansion</th></tr>
<tr><td colspan="4">Permanent Employees</td></tr>
<tr><td>Construction</td><td>-</td><td>60</td><td>60</td></tr>
<tr><td>Operational</td><td>715</td><td>115</td><td>830</td></tr>
<tr><td colspan="4">Temporary/Contract Employees</td></tr>
<tr><td>Construction</td><td>-</td><td>4000</td><td>4000</td></tr>
<tr><td>Operational</td><td>-</td><td>1500</td><td>1500</td></tr>
</table>
</td></tr>
</table>

Sr. No.	Particulars	Details
13	Project Cost	❖ Stage-I: Rs. 17,869.45 Cr (As per latest approved RCE-III Cost) ❖ Stage-II: Rs. 15,529.99 Cr (As per Investment Approval) ❖ Stage-III: Rs. 19168.95 Cr (At Current Cost level) **Total Cost: Rs. 52,568.39 Cr**

1.5 Resource Requirement

Land Requirement

A total 1039.09 Ha of land was acquired. [Pvt: 815.26 ha (Perpetual Leasehold Right of NTPC-Lara :811.381 Ha and full ownership Right of NTPC - Lara: 03.926 ha), Govt: 72.26 ha (Government Land 72.26 Transferred in favour of NTPC Lara) & Forest:151.76 ha (Diversion of Forest Land for Lara STPP) and 4.02 Ha land is under land acquisition process. In addition to the above 225.66 Ha of land (Pvt:212.32 ha, Govt:1.99 ha & Forest:11.35 ha) shall be acquired for Ash Dyke, Ash Pipe & Road Corridor, and Green belt corridor. (Govt Land of 40.89 ha was handed over to the respective village as CPR Land). The details of land breakup the project across Stage-I, Stage-II, and Stage-III is provided in following **Table 1.4.**

Table 1.4 Details of Land Requirements

Sr. No	Description	Stage-I (Ha)	Stage-II (Ha)	Stage-III (Ha)	Total (Ha)
1	Main Plant	157.89	107.69	71.66	337.24
2	Ash Dyke	168.02	0.00	125.00	293.02
	Sub Total (Plant & Ash Dyke)	**325.91**	**107.69**	**196.66**	**630.26**
3	Green Belt	90.88	12.71	103.44	207.03
	Green Belt (% of Main Plant & Ash Dyke Area)	27.88	11.80	52.60	33.00
4	Reservoir	54.66	23.89	0.00	78.55
5	Township	61.13	0.00	0.00	61.13
6	Peripheral Road (Public)	49.80	16.32	4.34	70.46
7	Ash Corridors	21.39	0.00	0.00	21.39

8	Rly Siding	31.17	6.62	2.23	40.02
Sr. No	**Description**	**Stage-I (Ha)**	**Stage-II (Ha)**	**Stage-III (Ha)**	**Total (Ha)**
9	Make-up water PH Area	2.85	0.00	0.00	2.85
10	Ash Brick Plant	0.00	0.00	2.83	2.83
	Total Project land (except Green belt in Ha)	**546.91**	**154.52**	**206.06**	**907.49**
11	Green belt outside Plant (NTPC acquired land)	0.00	87.04	26.32	113.36
	Total land (Ha)	**637.79**	**254.27**	**335.82**	**1227.88**

Note:1: Common Property Resource Land (40.89 Ha) handed over to respective village. The Green belt on 207.03 Ha will be developed inside the Plant boundary i.e: 33 % of the Main Plant and Ash Dyke area. Green belt of 320.39 Ha inside and outside of Plant on NTPC acquired land accounting to 35.3 % of the total Project land.

1.6 Baseline Environmental Status

For the Environmental Impact Assessment (EIA) Study of Lara Super Thermal Power Project (Stage-III: 2 × 800 MW), Baseline Environmental data generation was undertaken during the Pre-monsoon season (March 2025 to May 2025) as per the prevailing MoEF&CC EIA Notification requirements. The baseline monitoring was carried out by MITCON Consultancy & Engineering Services Ltd., Pune, a QCI-accredited and NABET-accredited EIA Consultant Organization (Certification No.: NABET/EIA/24-27/RA 0343, valid up to 05.02.2027) with NABL-accredited laboratory facilities (NABL Certificate No.: TC-5108, valid up to 29.12.2028).

The proposed Project is located in Tehsil Pussore, District Raigarh and Tehsil Dabhara, District Sakti, Chhattisgarh, covering the villages Armuda, Chhapora, Bodajhariya, Mahloi, Riyapalli, Kandagarh, Devalpura, Ghutkupali, Thengapali, Lara and Saradih. The 10 km study area for the proposed Stage-III Expansion lies entirely within the state of Chhattisgarh. Baseline monitoring for Ambient Air quality, Noise Environment, Water quality, Soil characteristics, land use and Ecology was conducted at representative locations within the study area in accordance with approved ToR and CPCB/MoEF&CC guidelines.

1.6.1 Meteorology

The surrounding Meteorological conditions are known to have an impact on pollution levels, influencing the spatial and temporal dispersion of pollutants. To assess the current meteorological conditions, secondary data from the nearest IMD station in Raigarh were obtained for verification and authentication. An online Automatic Weather Station (AWS) was installed at the NTPC Power Plant site in Lara, Chhattisgarh, located at coordinates 21°47'34.95" N and 83°27'23.00" E, to generate site-specific meteorological data. The general meteorological pattern for the region was initially established using secondary information obtained from previously published literature of the National Data Centre of the Indian Meteorological Department (IMD). To validate and refine these patterns, AWS operated at the Project site from March 2025 to May 2025, during which continuous measurements of key parameters such as temperature, relative humidity, rainfall, wind speed, and wind direction were collected. This on-site monitoring enabled a detailed understanding of local atmospheric conditions, ensuring that the meteorological baseline reflected the actual microclimate of the Project area rather than relying solely on regional data. The site-specific meteorological data are presented in **Table 1.5.**

Table 1.5 Average of the Site-Specific Meteorological Data

(March 2025 to May 2025)

Location: Near NTPC Lara

Latitude: 21.7930405° N, 83.4563883° E

Relative location: about 30 km NNE of Project site

Elevation: 15 m above MSL

Month	Temperature (°C)				Relative Humidity (%)		Rainfall (mm)		Mean Wind Speed (m/s)	Wind Direction
	Daily Min. Mean	Daily Max. Mean	Lowest in Month	Highest in Month	Min.	Max.	Monthly mm.	No. of Rainy Days		
March	28.78	30.49	14.88	39.82	13.2	90.13	9.8	3	1.26	SW
April	32.86	34.63	22.23	43.1	14.61	93.86	7.40	6	1.91	S
May	32.44	37.38	22.16	45.18	14.61	93.86	15.2	7	1.92	SE

The overall meteorological conditions recorded at the NTPC Lara Project site between March 2025 and May 2025 represent a typical pre-monsoon climatic profile for the region. Temperatures increase steadily and reach their peak in May, while relative humidity remains high, contributing to humid and thermally stressful conditions. Rainfall gradually increases, indicating the onset of pre-monsoon activity. Wind speeds rise moderately, and wind direction shifts from SW to SE, reflecting normal seasonal atmospheric circulation changes. These observations confirm that the site-specific meteorological data align well with the general patterns reported by the Indian Meteorological Department for this region during the summer months.

1.6.2 Ambient Air Quality

Ambient Air Quality monitoring conducted at ten locations in and around the Project area indicates that the baseline Air quality is within acceptable limits. The observed $PM_{2.5}$ concentrations ranged from 16.9 to 36.0 µg/m³, while PM_{10} levels varied between 41.4 and 68.3 µg/m³, with relatively higher values recorded near the plant site due to localized activities and vehicular movement. SO_2 concentrations ranged from 7.9 to 17.3 µg/m³ and NO_x levels from 11.0 to 24.9 µg/m³, both remaining well within the National Ambient Air Quality Standards (NAAQS), 2009. Carbon monoxide (CO) was below detectable limits at all locations**,** and ozone (O_3) concentrations ranged from 7.5 to 12.3 µg/m³**.** Further**,** Mercury, Lead, Ammonia, Benzene, Benzo(a)pyrene, Arsenic and Nickel were below detectable limits across all monitoring stations**,** indicating the absence of significant toxic Air pollutants in the study area during the monitoring period.

1.6.3 Land Use

The land use/land cover (LULC) analysis of the study area indicates that agriculture is the dominant land use, covering 19,766.15 ha (197.66 km²), accounting for 62.93% of the total area. Water bodies constitute 3,860.07 ha (38.60 km²), representing 12.29%, reflecting the presence of rivers, ponds and other surface water features within the study area. Scrub land occupies 2,621.42 ha (26.21 km²; 8.35%), while vegetation cover accounts for 2,275.55 ha (22.76 km²; 7.24%). Reserve forest areas comprise 2,023.71 ha (20.24 km²), equivalent to 6.44% of the total area. Built-up areas are limited, covering 683.31 ha (6.83 km²; 2.18%), and Industrial land use is minimal at

181.58 ha (1.82 km²; 0.58%). Overall, the study area is predominantly rural and agrarian in character, with limited industrial and urban development.

1.6.4 Surface Water Quality Observations

Surface water quality monitoring was carried out at six locations (SW-1 to SW-6) during the pre-monsoon season covering the months of March 2025, April 2025 and May 2025. The monitored Physico-chemical and bacteriological parameters were compared with the applicable CPCB Surface Water Quality Criteria (Class B and Class C) to assess the existing baseline status.

The observed pH values at all locations ranged from 6.55 to 7.23, indicating neutral to slightly alkaline conditions and remained well within the prescribed limits for both Class B and Class C waters. Dissolved Oxygen (DO) concentrations varied between 5.1 and 6.2 mg/l, satisfying the minimum requirement for Class B (≥5 mg/l) and Class C (≥4 mg/l), reflecting good oxygenation of the surface water bodies.

Biochemical Oxygen Demand (BOD) values were generally low, with most locations recording values below 3 mg/l, except at a few downstream locations where marginally elevated BOD (up to 6 mg/l) was observed, indicating localized organic load. Chemical Oxygen Demand (COD) levels were found to be low to moderate and did not indicate any significant organic or Industrial pollution.

Total Dissolved Solids (TDS) ranged from 241 to 438 mg/l, remaining well below the permissible limit of 1500 mg/l for Class C waters, while electrical conductivity values showed a gradual increase during peak summer months, attributable to evaporation and concentration effects. Turbidity and total suspended solids (TSS) were generally low at upstream locations; however, relatively higher TSS values were recorded at certain locations, possibly due to surface runoff and local anthropogenic activities.

The concentrations of major ions such as chloride, sulphate, nitrate and fluoride were well within the prescribed limits at all monitoring locations. Nutrient levels, including nitrate and phosphate, were found to be low to moderate, with slightly higher phosphate concentrations at downstream locations, indicating the influence of domestic runoff or agricultural inputs.

All heavy metals, including arsenic, mercury, cadmium, lead, chromium, copper, zinc and selenium were either below detection limits or well within the applicable standards, indicating no significant contamination from Industrial or other point sources.

Oil, grease and phenolic compounds were below detectable limits at all locations, suggesting the absence of hydrocarbon or phenolic pollution in the monitored surface water bodies.

With respect to Bacteriological quality**,** Total Coliform counts at SW-1 were well within the Class B criteria, while at other locations, the counts were within Class C limits, indicating the influence of local domestic discharges. E. coli was found to be below detection limits at all monitoring locations, suggesting minimal Faecal contamination during the monitoring period.

1.6.5 Ground Water Quality Observations

Groundwater quality monitoring was conducted at seven locations (GW-1 to GW-7) during the pre-monsoon season for the months of March 2025, April 2025 and May 2025. The analysed Physico-chemical and bacteriological parameters were compared with IS:10500 Drinking Water Standards to evaluate the baseline groundwater quality of the study area.

The pH of groundwater samples ranged from 6.66 to 7.39, indicating a neutral to slightly alkaline nature and remained well within the acceptable limits. Temperature showed normal seasonal variation, while turbidity and colour were found to be low at all locations, indicating clear groundwater conditions.

Total Dissolved Solids (TDS) varied from 232 to 981 mg/l. Most locations recorded TDS values within the desirable limit, while slightly elevated concentrations at a few locations indicate moderate mineralization of groundwater. Electrical conductivity followed a similar trend and increased marginally during peak summer months due to concentration effects.

Total hardness ranged from 113 to 481 mg/l, classifying groundwater from moderately hard to hard in nature at certain locations, which is typical of groundwater in the region. Alkalinity values indicated the presence of bicarbonates, contributing to the buffering capacity of groundwater.

Dissolved Oxygen levels ranged from 5.3 to 6.3 mg/l, while Biochemical Oxygen Demand (BOD) and Chemical Oxygen Demand (COD) were found to be very low, indicating the absence of organic pollution in groundwater.

The concentrations of major ions such as Chloride, Sulphate, Nitrate and Fluoride were well within the permissible limits at all monitoring locations. Nitrate levels were low, suggesting minimal influence of agricultural runoff or sewage intrusion. Fluoride

concentrations were observed to be significantly below the prescribed limits, indicating no risk of fluoride-related health issues.

With respect to Heavy Metals, all analysed parameters, including Arsenic, Mercury, Cadmium, Lead, Chromium, Copper, Zinc and Selenium, were found to be either below detection limits or within permissible standards at all groundwater monitoring locations, indicating no contamination from Industrial or anthropogenic sources.

Oil, Grease and Phenolic Compounds were below detectable limits in all samples, further confirming the absence of chemical pollution.

The Bacteriological analysis revealed that Total Coliforms and E. coli were below detection limits at all groundwater locations, indicating that the Groundwater is Microbiologically safe and free from faecal contamination.

Overall Assessment

Based on the monitoring results, groundwater quality in the study area is generally fit for drinking purposes after conventional treatment and disinfection. The baseline groundwater Environment does not indicate any significant pollution and reflects natural hydrogeochemical characteristics of the region with minor seasonal variations.

1.6.6 Noise Levels

Day-time Noise Levels (Lday)

The 24-hour average day-time noise levels at residential locations (NV1 to NV3 and NV5 to NV10) ranged between 40.4 and 45.7 dB(A), which are well within the permissible limit of 55 dB(A) for residential areas as prescribed under NAAQS, 2009. At the industrial location (NV4 – Plant Site), the day-time noise level was 53.9 dB(A), remaining within the prescribed industrial limit of 75 dB(A).

Night-time Noise Levels (Lnight)

The night-time noise levels at residential locations (NV1 to NV3 and NV5 to NV10) varied from 36.8 to 43.7 dB(A), which are below the stipulated residential night-time limit of 45 dB(A) under NAAQS, 2009. At the industrial location (NV4 – Plant Site), the night-time noise level was recorded as 46.0 dB(A), also well within the permissible industrial limit of 70 dB(A).

1.6.7 Soil Quality

The soil quality assessment within the 10 km study area indicates that the soils are predominantly *clay loam* in texture, with clay content ranging between 39–49%, moderate silt, and relatively lower sand fractions. Soil pH across all locations remains slightly alkaline (7.49–8.24), while electrical conductivity values (0.358–0.636 dS/m) suggest non-saline soils suitable for Agriculture. The nutrient profile shows moderate levels of available Nitrogen (128.9–190.5 kg/ha), medium to high available Phosphorous (14.73–26.12 kg/ha) and adequate Potassium (210.63–288.2 kg/ha), indicating overall balanced fertility. Micronutrient concentrations, including Iron (1.88–10.36 mg/kg), Zinc (0.73–1.39 mg/kg), Copper (0.53–3.12 mg/kg) and Manganese (3.27–9.32 mg/kg), fall within acceptable Agricultural ranges, showing no deficiency or toxicity concerns. Cation Exchange Capacity (26–42 meq/100 g) reflects good nutrient-holding capacity consistent with clay loam soils. Overall, the soil characteristics indicate Healthy, Nutrient-supportive and Agriculturally Productive Soils in the study region.

1.6.8 Infiltration Test

The infiltration study conducted at ten locations (IF01 to IF10) within the study area indicates that the soils are predominantly red loam, with isolated occurrences of lateritic soil and red loam mixed with sandy soil**.** Ground elevations across the sites range from 195 m to 224 m above mean sea level**.** The average infiltration rates vary between 1.0 and 6.6 cm/hr**,** reflecting moderate to very rapid infiltration characteristics. Moderate infiltration rates (1.0–2.33 cm/hr) were observed at locations IF01, IF04, IF08 and IF10, while rapid infiltration rates (2.08–6.0 cm/hr) were recorded at IF02, IF03, IF05, IF06 and IF07. Very rapid infiltration (6.6 cm/hr) was noted at IF09. Overall, the study area exhibits generally good soil permeability, which is conducive to groundwater recharge and effective storm water percolation.

1.6.9 Ground Water Level (Phreatic Surface) Study

A survey of groundwater sources in the study area was carried out at ten locations covering Deolsura, Lohakhan, Kandagarh, Kondapali, Lara, Chhote Haldi village, Tarda, Kathani village, Darripali and Nawarpara (A). Based on the pre-monsoon field survey carried out at ten locations within the study area, the depth to the groundwater table ranges from approximately 24.38 m bgl to 54.86 m bgl, indicating moderate to

deep groundwater occurrence across the villages. The shallowest groundwater level was observed at Kandagarh (≈24.38 m bgl), whereas the deepest water level was recorded at Chhote Haldi (≈54.86 m bgl) during the pre-monsoon period.

1.6.10 Flora and Fauna

Terrestrial

Flora

A total of 107 Plant species were recorded in the study area during the survey period, comprising 78 tree species, 14 shrubs, 7 climbers, and 8 grass species. Six species, namely *Aegle marmelos, Chloroxylon swietenia, Pterocarpus marsupium, Cleistanthus collinus, Tectona grandis* and *Dalbergia latifolia* categorized as Rare, Endangered, or Threatened (RET) were also documented within the study area. Common Plant taxa such as *Mangifera indica*, *Madhuca longifolia*, *Azadirachta indica* and *Diospyros melanoxylon* were widely observed.

Fauna

A total of 73 bird species were recorded during the survey, reflecting high avian diversity in the region. Notably, Cotton Pygmy Goose**,** Common Pochard and Shikra were documented, all of which are listed under Schedule I of the Wildlife (Protection) Act, 1972, indicating their elevated conservation importance. The Common Pochard (*Aythya ferina*)**,** also categorized as a Vulnerable (RET) species**,** further highlights the ecological significance of the area. The Project site lies approximately 1.5 km east of the Hirakud Reservoir, a designated Ramsar Site, which serves as an important wetland habitat supporting diverse aquatic and terrestrial fauna. QuestionnAire and field surveys documented 6 mammal species and 8 herpetofaunal species, demonstrating a representative faunal assemblage of the region. Lepidopteran diversity was also found to be substantial, with 39 butterfly species recorded, dominated by the family Nymphalidae**.** Common taxa observed include Common Rose, Lime Butterfly, Common Jay, Common Emigrant, Common Grass Yellow, Blue Tiger, Plain Tiger, and Lesser Grass Blue, indicating healthy floral resources and functioning pollinator networks. A total of 54 fish species were documented in the study area, including 5 RET species, namely *Ailia coila*, *Ompok pabda*, *Ompok bimaculatus*, *Tor putitora* and *Wallago attu* with Rohu, Catla, Mrigal, Khoksi, and Common Carp being commonly encountered. Collectively, the diversity of Avifauna, Butterflies, Fish

and other faunal groups reflects a Biologically Rich Ecosystem with significant Conservation value.

Aquatic

A total of 26 Phytoplankton genera from 4major groups were recorded from sampling locations. The most common genera found were *Aphanocapsa, Anabaena, Oscillatoria, Navicula, Nitzschia* and *Ankistrodesmus,* while the density of Zooplankton varied between 2115 and 1382 N/m^3 representing 10 genera. Rotifera dominated in all the samples, followed by Cladocera and Copepoda.

1.7 Anticipated Environmental Impacts and Mitigation Measures

The Anticipated Operation Phase Impacts on key Environmental components i.e Air, Water, Soil, Ecology and the Socio-economic setting have been Assessed and summarised in **Table 1.6**. A brief Mitigation measures for all relevant Impacts are outlined in the following subsections to ensure effective Environmental Management.

Table 1.6 Anticipated Operation Phase Impacts on Environmental Components

Environmental Component	Likely Operation Phase Impacts
Air Environment	➢ Stack Emissions containing PM, SO_2, NO_x from boiler operations ➢ Fugitive dust from coal handling, transfer points and Ash areas ➢ Vehicular Emissions from Ash transportation and internal Plant movement
Water Environment	➢ Withdrawal of water may influence downstream availability ➢ Generation of wastewater from cooling tower blowdown, DM Plant, filter backwAsh and other treatment units. ➢ Risk of contamination from runoff in coal/Ash handling areas if not managed ➢ The Project is proposed for Zero Liquid Discharge (ZLD) compliant.
Soil & Land Environment	➢ Deposition of particulate matter may affect soil quality near Plant area ➢ Accidental leakage/spills from fuel, chemicals or lubricants may contaminate soil ➢ Storage and disposal of Ash may alter local land characteristics if not controlled
Ecological Environment (Flora & Fauna)	➢ Potential effect on Aquatic organisms due to Thermal discharge or Biocide containing cooling water Occasional Bird and small Fauna disturbance due to continuous Plant activity and night lighting ➢ Vegetation near the Plant may experience dust deposition or changes due to gaseous Emissions
Socio-Economic Environment	➢ Increased Employment and Business Opportunities during Operation phase ➢ Improved regional Infrastructure due to continuous Industrial activity ➢ Occasional Traffic congestion on approach roads due to ash transportation

1.7.1 Impact on Land Use and Land Cover

The Lara Super Thermal Power Project (STPP) Stage-III (2 × 800 MW) is proposed as an expansion within the existing NTPC Lara STPP with the new acquigition of additional land of 225.66 Ha (Pvt:212.32 ha, Govt:1.99 ha & Forest:11.35 ha) for Ash Dyke, Ash Pipe & Road Corridor and Green belt industrial complex. Which will change exiting land use to industrial land use.

1.7.2 Impact on Soil Environment

During the operation phase, impacts on soil are expected to be localized, limited and manageable. Potential impacts may arise due to deposition of particulate matter in the

vicinity of coal handling, Ash handling and material storage areas, and accidental spills of fuels, oils or chemicals.

These impacts shall be mitigated through paved surfaces, enclosed material handling systems, dust suppression measures, proper storage with secondary containment, and adherence to standard operating procedures. With the implementation of these measures and greenbelt development, no long-term degradation of soil quality is anticipated.

1.7.3 Impact on Air Quality (Based on Dispersion Modelling)

Atmospheric dispersion modelling was carried out using the AERMOD modelling system to evaluate the cumulative impact of emissions from the existing Stage-I units, under-construction Stage-II units, and the proposed Stage-III (2 × 800 MW) units on ambient Air quality in the surrounding area. The modelling incorporated site-specific meteorological data, stack parameters, emission loads, terrain characteristics and identified sensitive receptors.

The PM_{10} modelling results indicate incremental concentrations ranging from 0.10 to 0.42 µg/m³ over baseline levels. Baseline PM_{10} concentrations vary between 56.4 and 68.2 µg/m³, while resultant total concentrations range from 56.79 to 68.62 µg/m³, with the maximum observed at AAQ-9 (Hotel Meher – Plant Site near Main Gate). All values remain well below the 24-hour NAAQS of 100 µg/m³.

Similarly, $PM_{2.5}$ incremental concentrations range from 0.07 to 0.28 µg/m³ over baseline levels. Baseline concentrations vary between 29.1 and 35.9 µg/m³, while resultant total concentrations range from 29.36 to 36.18 µg/m³, remaining well within the 24-hour NAAQS of 60 µg/m³.

The predicted incremental NO_x concentrations range from 1.76 to 7.07 µg/m³, with resultant total concentrations between 19.36 and 31.97 µg/m³, which are well below the 24-hour NAAQS of 80 µg/m³. For SO_2, incremental concentrations range from 3.46 to 14.00 µg/m³, and total concentrations range from 17.16 to 30.00 µg/m³, remaining significantly below the 24-hour NAAQS of 80 µg/m³.

The Modelling results demonstrate that the incremental contribution of the proposed Stage-III units is marginal, and cumulative concentrations are primarily governed by baseline conditions. Effective dispersion is attributed to the 275 m stack height, favourable meteorological conditions and efficient plume rise. No exceedance of ambient Air quality standards is predicted at any sensitive receptor, indicating that the Project will not cause significant deterioration of ambient Air quality.

1.7.4 Water Requirement and Management

The total water requirement for Lara STPP Stage-III is estimated at 1,600 m³/hr (38,400 KLD), which will be sourced from the Saradih Barrage on River Mahanadi through approved allocation. Water demand includes Cooling water, Process water, domestic use and Greenbelt development.

The Project shall operate under a Zero Liquid Discharge (ZLD) regime. Total effluent generation is estimated at 1,050 m³/hr (25,200 KLD), out of which 865 m³/hr (20,760 KLD) shall be reused in Ash slurry handling and disposal systems. The remaining treated effluent shall be recycled within the plant, ensuring minimal freshwater withdrawal and sustainable water use.

1.7.5 Impact on Groundwater

The Project area falls under a semi-critical groundwater category; however, no groundwater abstraction is proposed for operational activities. Rainwater harvesting systems covering approximately 42,046.83 m² of rooftop area shall be implemented to augment groundwater recharge. Consequently, no adverse impact on groundwater quantity or quality is anticipated.

1.7.6 Impact on Hydrology and Drainage

The natural drainage pattern of the area shall be preserved. Stormwater runoff from plant and Ash dyke areas shall be collected through a properly designed drainage network and routed through sedimentation systems, preventing flooding, soil erosion and contamination of nearby water bodies.

1.7.7 Impact due to Solid Waste (Ash) Generation and Management

Fly Ash and bottom Ash constitute the primary solid wastes generated during the operation phase. In the absence of appropriate management, Ash handling could lead to fugitive dust emissions, land degradation and potential contamination of surface and groundwater.

The Project incorporates dry Ash collection systems, closed Ash conveying and High Concentration Slurry Disposal (HCSD) systems, minimizing dust generation and spillage. A comprehensive Ash utilization plan has been developed to ensure maximum utilization in cement manufacturing, construction and other approved end uses, in compliance with MoEF & CC notifications.

Table 1.7 Expected Solid Waste Generation from the Proposed Expansion Project

Sr. No.	Description	Quantity (MTPA)	Mode of Disposal / Utilization
1	Fly Ash	2.236	Utilization in cement, construction and other approved uses; surplus disposed in Ash pond through HCSD
2	Bottom Ash	0.559	Utilization in construction and disposal in Ash pond through LCSD
	Total	**2.795**	**Maximum utilization with safe disposal of non-lifted Ash**

With these measures, impacts due to solid waste generation shall remain localized, controlled and Environmentally acceptable.

Overall,Environmental Impact Assessment for the proposed expansion of Lara STPP from 3,200 MW to 4,800 MW indicates that the Project is environmentally acceptable. Dispersion Modelling confirms that cumulative concentrations of PM_{10}, $PM_{2.5}$, SO_2 and NO_x remain well within National Ambient Air Quality Standards at all sensitive locations. With the adoption of Ultra-supercritical technology, High-efficiency pollution control systems, Effective Ash management, Air Cooled Condenser System, ZLD-based water management and continuous monitoring, the proposed Stage-III units will not result in any significant adverse Environmental Impacts.

The Project can therefore be implemented safely, subject to strict compliance with statutory Environmental regulations throughout its Operational life.

1.8 Environmental Management During Construction Phase

Construction activities associated with the proposed Project may result in temporary impacts on ambient air quality, noise levels, surface runoff, sanitation, and aesthetics. These impacts are localized and short-term in nature and can be effectively managed through the implementation of suitable mitigation measures. The proposed Environmental safeguards to be adopted during the construction phase are summarized in **Table-1.8**.

Table 1.8 Proposed Mitigation Measures to be Implemented During Construction Phase

Proposed Mitigation Measures	Responsibility for Implementation	Target to be Achieved	Risks & Consequences of Failure
Regular water sprinkling at excavation sites, haul roads and material handling areas	NTPC / Contractor	Suppression of dust emissions from construction activities	Elevated PM levels in Ambient Air
Periodic servicing and emission checking of construction vehicles and equipment	NTPC / Contractor	Reduction of exhaust emissions from diesel-operated machinery	Increase in SO_2, NOx and CO levels
Transportation of construction materials using covered vehicles wherever feasible	NTPC / Contractor	Control of dust dispersion during material transport	Increased fugitive dust emissions
Preventive maintenance of construction machinery	Contractor	Control of equipment-related noise levels	Rise in Ambient and work-zone noise
Provision of acoustic enclosures or noise dampening	Contractor	Reduction of noise exposure to workers and nearby areas	Excessive noise exposure

Proposed Mitigation Measures	Responsibility for Implementation	Target to be Achieved	Risks & Consequences of Failure
arrangements for high-noise equipment			
Supply and mandatory use of ear plugs/ear muffs in high-noise zones	Contractor	Occupational health protection	Hearing impairment to workers
Development of temporary drainage network and sedimentation tanks for construction runoff	NTPC / Contractor	Reduction of suspended solids in construction effluents	Increased turbidity in surface runoff
Provision of hygienic labour camps with proper drainage and waste disposal	NTPC / Contractor	Safe and healthy living conditions for workforce	Health risks and disease spread
Arrangement of adequate drinking water supply and sanitation facilities	NTPC / Contractor	Reduced dependency on local resources	Social conflict and pressure on local infrastructure
Scientific disposal or reuse of surplus earth and construction debris	NTPC / Contractor	Prevention of land, Air and Water pollution	Land degradation and pollution
Landscaping and vegetative cover on unused land parcels	NTPC	Improvement in site aesthetics and dust control	Visual degradation of Project area

1.9 Environmental Management During Operation Phase

Environmental impacts during the operational phase are continuous and long-term in nature. Accordingly, comprehensive mitigation and monitoring measures are proposed to minimize emissions, conserve resources, and ensure regulatory compliance. The mitigation measures proposed during the operation phase are presented in **Table-1.9**

Table 1.9 Proposed Mitigation Measures to be Implemented During Operation Phase

Mitigation Measures Proposed	Responsibility	Target to be Achieved	Risks & Consequences of Failure
Installation of high-efficiency Electrostatic Precipitators	NTPC	Control particulate emissions within prescribed limits (≤30 mg/Nm³)	Elevated PM concentration
Provision of tall stack of appropriate height	NTPC	Effective dispersion of gaseous pollutants	Increased ground-level pollutant concentration
Adoption of NOx control technology	NTPC	Reduction of NOx emissions to CPCB limits	Increased NOx emissions
Dust extraction and suppression systems in coal handling areas	NTPC	Control of fugitive dust emissions	Deterioration of Ambient Air quality
Water spraying / surface wetting at Ash disposal areas	NTPC	Suppression of Ash dust	Fugitive Ash emissions
Effluent Treatment Plant (ETP) for Plant wastewater	NTPC	Compliance with effluent standards and ZLD operation	Deterioration of surface and groundwater
Sewage Treatment Plant (STP) for domestic wastewater	NTPC	Treatment and reuse of sewage water	Biological contamination
Optimization of freshwater requirement	NTPC	Conservation of water resources	Increased freshwater demand
Closed cycle cooling system with specified COC	NTPC	Reduction of make-up water and thermal impact	Thermal stress on receiving water body
Ash water treatment and recycling system	NTPC	Reuse of decanted overflow water from Ash dyke, Minimize freshwater withdrawal	Overflow and Ash water loss

Mitigation Measures Proposed	Responsibility	Target to be Achieved	Risks & Consequences of Failure
Noise control through equipment design and acoustic measures	NTPC	Maintain workplace noise levels within 90 dB(A); implement Hearing Conservation Programme above 85 dB(A)	Occupational hearing loss; non-compliance with statutory standards
Provision of PPE for workers	NTPC	Protection from occupational hazards	Worker health issues
Dry fly Ash collection and utilization	NTPC	Maximize Ash utilization	Increased Ash disposal requirement
Safe disposal of unutilized Ash	NTPC	Environmental protection	Land degradation
Scientific handling of municipal solid waste	NTPC	Hygienic township management	Health hazards
CSR/CD/CER initiatives	NTPC	Socio-economic development	Community dissatisfaction
Greenbelt and Plantation development	NTPC	Pollution attenuation and aesthetics	Reduced Environmental buffering
Fire and explosion control systems	NTPC	Plant safety	Major Industrial accidents

1.10 Environmental Monitoring Program

Environmental monitoring for the Project will be carried out in accordance with the guidelines of the Central Pollution Control Board (CPCB) and the Chhattisgarh Environment Conservation Board (CECB). The frequency and locations of Air, Noise, Surface water and Groundwater sampling will follow the directives issued by CECB to ensure compliance with regulatory standards.

1.11 Risk Assessment and Disaster Management Plan

A Risk assessment has been conducted for the proposed expansion Project to evaluate potential hazards and provide recommendations for enhancing safety. Appropriate risk control measures, based on consequence analysis and engineering considerations, have been incorporated to strengthen system safety and reduce the

impact of any major incidents. A comprehensive Disaster Management Plan (DMP) has also been established for the Project expansion, outlining the roles, responsibilities, and resources required to address various emergency scenarios. Regular training and simulation exercises will be conducted to ensure personnel are well-prepared, aware of their duties and able to maintain effective communication during emergencies.

1.12 Project Benefits

The proposed expansion Project is expected to have a positive impact on local civic amenities once operations begin. Under its corporate social responsibility initiatives, the Project will support welfare programs for disadvantaged groups, including widows and persons with disabilities. Community development efforts will include skill development and self-employment training for women, Improvement of drinking water facilities, Construction of community toilets, support to Government Schools, provision of Scholarships and organization of Sports and Cultural events. A dedicated budget will be allocated for these activities during plant operation. Additionally, regular medical and health awareness camps will be conducted in nearby villages across Chhattisgarh to promote Public Health and well-being. The proposed Project expansion will generate significant employment opportunities during both the Construction and Operation phases. During the construction phase, the manpower requirement is estimated at 60 permanent personnel and approximately 4,000 contractual workers, engaged for civil works, erection, installation, and allied activities. During the operation phase, the Project will require around 115 permanent employees for Plant operation, maintenance, and administrative functions, along with about 1,500 contractual workers to support routine operations, maintenance, and ancillary services. Thus, the Project will contribute to local and regional employment generation and support Socioeconomic development in the Project's influence area.

1.13 Environmental Cost

A capital cost provision of Rs. 158051.00 lakhs towards Environmental Protection measures/EMP and the recurring cost of Rs. 3161.02 lakhs per Annum (as an operations & management cost) have been earmarked.

1.14 Conclusions

NTPC proposes Stage-III expansion of the existing Lara Super Thermal Power Project (Lara STPP) by the addition of 2 × 800 MW units, enhancing the total installed capacity from 3200 MW to 4800 MW. The Proposed Expansion will be implemented within the existing Project infrastructure, available vacant land with proposed acquigision of additional land of 225.66 Ha (Pvt:212.32 ha, Govt:1.99 ha & Forest:11.35 ha) for Ash Dyke, Ash Pipe & Road Corridor, and Green belt corridor. This ensuring optimal utilization of land resources. Baseline studies show the Project area has favorable Environmental conditions and anticipated impacts on Air, Water, Soil, Noise and Biodiversity are localized, reversible and manageable. Mitigation measures, including Pollution control systems, Greenbelt development, Ash Management, Water recycling and Rainwater harvesting, will ensure compliance with CPCB/CECB standards. The Project also offers significant Socio-economic benefits, including Employment, community development and health initiatives. With Environmental safeguards in place, the Project is Environmentally sustainable and will provide reliable power while contributing positively to regional development.