MEMORANDUM OF UNDERSTANDING BETWEEN THE GOVERNMENT OF ORISSA AND M/s POSCO FOR ESTABLISHMENT OF AN INTEGRATED STEEL PLANT AT PARADEEP.

This Memorandum of Understanding is made on the Wednesday day of June 22, 2005, between the Governor of Orissa on the one part and M/s POSCO on the other part.

1. M/s POSCO having its registered office at 1 Koidong-Dong, Nam-Ku, Pohang-City, Kyungsanbuk Province, Republic of Korea, (hereinafter referred to as POSCO, which expression shall, unless repugnant to the context or meaning thereof, include its successors, executors, administrators, representatives and permitted assignees), is proposing to set up an Integrated Steel Plant of a total capacity of 12 million tonnes per annum in the State of Orissa at Paradeep, in Jagatsinghpur district.

2. The Government of Orissa, desirous of utilizing its natural resources and rapidly industrializing the State, so as to bring prosperity and wellbeing to its people, has been making determined efforts to establish new industries in different locations. In this context, the Government of Orissa have been seeking to identify suitable promoters to establish new Integrated Steel Plants in view of the rich iron ore and coal deposits in the State.

3. POSCO will establish an Indian company (hereinafter referred to as the “Company”) through their relevant subsidiaries, related companies or third parties nominated by POSCO to invest in the State of Orissa in:
   (A) steel manufacturing;
   (B) infrastructure necessary for the Integrated Steel Plant and related Projects; and
   (C) related mining of iron ore and other ores.

4. The Company is desirous of developing and operating the following facilities on the basis described in this MoU in the State of Orissa with proposed investment of around US$ 12 billion or Rs. 51,000 crores (approximately). The details of the facilities are given in the table below:

<table>
<thead>
<tr>
<th>Project</th>
<th>Project Details</th>
<th>Project cost in Rs. Crore (Approx.)</th>
<th>Time Schedule</th>
<th>Finished products</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steel Plant with FINEX / BF, along with other facilities like Lime Calcinng Plant, Oxygen Plant, Captive Power Plant, Phase-1</td>
<td>1&lt;sup&gt;st&lt;/sup&gt; Module Crude Steel 3 MTPA Finished Steel 2.82 MTPA</td>
<td>10,100</td>
<td>To be commissioned by July 2010 or 36 months from the date of (i) taking title to and possession of land, (ii) registration of the executed prospecting licence, whichever is later</td>
<td>Slabs (3MT)</td>
</tr>
<tr>
<td></td>
<td>2&lt;sup&gt;nd&lt;/sup&gt; Module Crude steel</td>
<td>11,800</td>
<td>To be commissioned by July 2012 or 24</td>
<td>Hot rolled Coil</td>
</tr>
<tr>
<td>Phase</td>
<td>3MTPA</td>
<td>1st Module</td>
<td>2nd Module</td>
<td>Note:</td>
</tr>
<tr>
<td>-------</td>
<td>-------</td>
<td>------------</td>
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<td>-------</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Crude Steel -3MTPA</td>
<td>Crude steel – 3MTPA</td>
<td>Detailed time schedule for the commissioning of each phase will be determined pursuant to Clause 18.</td>
</tr>
<tr>
<td>Phase-2</td>
<td>6 (in two modules of 3 MT each)</td>
<td>Finished Steel -2.82MTPA</td>
<td>Finished Steel -2.82MTPA</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>To be commissioned by July 2014 or 24 months from commissioning of Phase -1, Module -2, whichever is later</td>
<td>To be commissioned by July 2016 or 24 months from commissioning of Phase -2, Module -1, whichever is later</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Slabs (3MT)</td>
<td>Hot Rolled Coil (4.5MT), Plate, Cold rolled coil (1.5MT) etc.**</td>
<td></td>
</tr>
</tbody>
</table>

1. **Cumulative of Phase-1;**

2. **Cumulative of Phase-2.

(2) The Company is also desirous of developing and operating the following related infrastructure based on the needs of the “Steel Project”, on the basis described in this MoU:

i. mining facilities in the areas allocated by Government of Orissa/Government of India (the “Mining Project”);

ii. road, rail and port infrastructure (the “Transportation Project”), including the dedicated railway line from the mine-belt to Paradepet;

iii. integrated township; and

iv. water supply infrastructure (the “Water Project”).

(3) The Steel Project will be located at Paradepet. The Mining Project will be established at the mining site(s) that are identified as the mineral resources for the Company.

(4) To achieve the foregoing purposes, the Government of Orissa and the Company agree to be “Partners in Development” and have, therefore, come together to record their intentions through this MoU.

5. **LAND:**

(i) The Company will establish their registered office and national headquarters in the State of Orissa, in the city of Bhubaneswar. The Government of Orissa will identify, acquire and transfer a suitable tract of land between 20 and 25 acres for this purpose, in accordance with the specifications provided by the Company.

(ii) The Company will require approximately 4,000 acres of land (hereinafter referred to as the “Land”) for the purpose of setting up the Steel Project and associated facilities, including the port facilities and a storage yard for coking coal.

(iii) In addition, the Company will require approximately 2,000 acres of land for township development, recreational activities and all related social
infrastructure development (collectively, the "Integrated Township Development"). Out of this, approximately 1,500 acres would be identified adjacent/near to the Steel project and another 500 acres (approx.) near the Mining Project.

State Government will facilitate all clearances and approvals of the Central Government, if required.

(iv) In addition to the land required for the core activities of the Overall Project, the Company may require additional land pockets for development of the "transportation project", the "water project" and any other project-related infrastructure facilities.

(v) The Government of Orissa agrees to acquire and transfer all the above-mentioned land required for the Overall Project, free from all encumbrances through Orissa Industrial Infrastructure Development Corporation (IDCO) on payment of the cost of land.

(vi) The Company shall pay to the relevant authority (ies) the cost of such land. For private land, the Company shall pay the cost as determined under the provisions of the Land Acquisition Act and incidental charges as mutually agreed upon. For Government land, the Company shall pay as per the rates determined by the prevailing Industrial Policy Resolution on this date. For forest land, the Company shall pay the rates determined under the applicable Rules.

(vii) On its part, the Government of Orissa will expeditiously and within a reasonable time frame, hand over to the Company non-forest Government land for which the Company has completed all formalities. Acquisition of private land will be taken up on priority.

(viii) For rehabilitation of displaced families, Rehabilitation and Resettlement Package would be implemented as per prevailing guidelines and practices.

6. RAW MATERIALS:

(i) Coal: The State Government agrees to recommend to the Government of India for allotment of suitable coal blocks for captive coal mining for the project either directly or through a PSU. Further, the State Government will assist the Company to get the allocation of coal linkage of suitable grade in the desired quantity to meet its requirement until it is ready for mining of its coal block.

(ii) Iron Ore: The Company will need the equivalent of 600 million tonnes of iron ore of an average Fe content of 62%, to meet the requirements of the proposed Steel Project of 12 million tonnes per annum. The Company may swap certain quantities (not exceeding 30% of the total requirement for the Paradeep Plant annually) of such iron ore which have high alumina content with equal quantity of low alumina content iron ore of equivalent or better Fe content imported for blending, in order to produce better quality steel in the Paradeep Project and conserve energy. Any export of iron ore by way of swap will be allowed only after an equivalent quantity of ore has been imported for the plant. The extent of the above quantity of iron ore by way of replacement for equal quantity of import of higher grade iron ore, will be within the framework of the Export-Import Policy of the Government of India applicable
from time to time. It is clarified that no export of iron ore will be allowed from the captive mine except by way of full replacement through import of equal quantity of high grade ore and within the limits mentioned above.

(iii) The Government of Orissa agrees to grant prospecting licenses and captive mining leases for 600 million tonnes of iron ore to the Company after following prescribed procedures and completion of required milestones including approvals of Government of India. For this purpose, the Government of Orissa shall recommend to the Central Government and use its best efforts to obtain the Central Government’s approval within the minimum possible time for the grant of prospecting licenses and the captive mining leases for the iron ore mines.

(iv) The Government of Orissa will recommend grant of the Prospecting Licences only after the following milestones have been achieved:
   a) Formation of the Indian Company referred to in Clause - 3 has been done;
   b) Feasibility study has been started and a Detailed Project Report has been commissioned (July - November, 05);
   c) Additional Soil test and site survey has been started;
   d) Preparation of Port Development Plan has been commissioned (July,05 - January,06);
   e) Preparation of Industrial Water Development Plan has been commissioned (July, 05 – January, 06);
   f) Preparation of Township Master Plan has been commissioned (August,05 – March 06);
   g) Preparation of Environment Impact Assessment Study has been commissioned (July,05 – January,06);
   h) Requisition has been submitted to the Orissa Industrial Infrastructure Development Corporation (IDCO) for acquisition of land for the steel plant as well as the port;
   i) The Indian Company is provided with paid up equity to the tune of at least US$ 50 million to enable it to undertake all the preparatory work required for setting up the plant.

(v) The Government of Orissa will recommend such areas as are free from litigation as well as encumbrances. In the event of litigation at any stage, Government of Orissa will diligently defend their recommendations made in favour of the Company in the appropriate judicial, quasi judicial fora.

(vi) Prior to recommending the case of the Company for Mining Lease, the State Government will ensure that the following milestones have been achieved:
   a) The Company has submitted the Detailed Project Report;
   b) The Company has submitted the Port Development Plan;
   c) The Company has submitted the Industrial Water Development Plan;
   d) The Company has submitted the Township Master Plan;
   e) The Company has ensured that application for Environment Impact Assessment Study has been submitted to the Government of India;
   f) The Company has filed necessary requisition for land for different components of the project with IDCO and has deposited necessary funds;
   g) The Company has submitted the rehabilitation and re-settlement package for the oustees to the competent authority and received the approval of Government of Orissa;
h) The Company has submitted the proposal with requisite details for diversion of forest land which the Government of Orissa will recommend to the Government of India;

i) The Company has applied for Coastal Regulation Zone (CRZ) clearance.

(vi) The Indian Company is provided with paid up equity to the tune of at least US$ 200 million to enable it to undertake adequate investment connected with the setting up of the plant.

(vii) Recommendation for the mining lease will be made in two phases, commensurate with the first two modules and the last two modules of 3 million tonnes each. The recommendation will, however, be subject to suitable adjustment of mining blocks. State Government will take a decision pertaining to the first phase after the following milestones have been achieved for the first phase of 6 million tonnes:

a) Award of 50% of orders for civil and structural contracts in terms of value.

b) Placement of 20% of firm orders for machinery in terms of value.

(viii) State Government will make recommendation pertaining to the second phase after:

a) Commissioning of the first module of 3 million tonnes of the first phase has been achieved;

b) Award of 50% of orders for civil and structural contracts in terms of value for the second phase of 6 million tonnes;

c) Placement of 20% of firm orders for machinery in terms of value for the second phase of 6 million tonnes.

d) The State Government agrees to assist the Company in making a firm arrangement with the Orissa Mining Corporation (OMC) along with other private iron ore lessees in the State, to meet a substantial portion of the requirement of iron ore of suitable grade for initial period of steel making under mutually agreeable terms and conditions, if required by the Company.

(x) All iron ore Mining Leases and Prospecting Licenses shall be clean and free of any encumbrances.

(xi) Before the grant of mining lease, the Company would submit a detailed progress report of all components of the project with reference to the agreed implementation schedule (referred to Clause 18 (ii) hereinafter). The mining lease would be granted subject to the satisfaction of the Government of Orissa that adequate progress has been achieved in all critical parameters.

(xii) The iron ore mining leases shall be granted to the Company initially for a period of 30 years and will be considered for renewal on an application by the Company before expiry, for another 20 years.

(xiii) The Government of Orissa will assist the Company in obtaining all clearances, including forest and environment clearance and approval of the State Pollution Control Board, and the Ministry of Environment and Forest, Government of India under Forest (Conservation) Act, 1980 and Environmental (Protection) Act, 1986 for opening up the iron ore mines, laying roads, constructing township etc.

(xiv) The Government of Orissa agrees to provide all possible assistance to the Company for acquiring mineral concession for limestone and dolomite within the ambit of the MMDR Act and MC Rules.

(xv) Govt. of Orissa will make best efforts and provide all possible assistance to POSCO for expeditious clearance of applications relating to mining lease and related matters such as forest, environment etc. so as to enable
POSCO to start its mining operations in time to synchronize with the commissioning of its steel plant.

POSCO have requested to source an additional 400 MT of iron ore from India for their existing steel plants in South Korea. This can be done through a long-term commercial supply arrangement from the open market. Any such trading arrangement shall fall entirely within the domain of the Government of India and will be regulated by the prevailing Export – Import Policy of the Country. No mine-able reserves can be provided by Government of Orissa purely for the purpose of direct exports beyond what has been indicated for value addition in the steel plant of the Company in Orissa in the preceding paragraphs. However, Government of Orissa will assist POSCO in establishing suitable contacts and interfaces with Government of India for this purpose.

(xvi) **Chrome Ore**: State Government will facilitate suitable long term arrangement with OMC and other lessees for supply of chrome ore to meet the requirement of the plant.

(xvii) **Manganese Ore**: The State Government would consider assigning appropriate priority to an application of the Company for mineral concession for manganese ore in the State as and when available within the ambit of MNDR Act and MC Rules.

7. **WATER**

(i) The Government of Orissa will permit drawal and use of water from the Mahanadi barrage at Jobra in Cuttack or any other suitable source for construction and operation of the Overall Project as per the prevailing rates and appropriate terms and approval of the Water Allocation Committee, subject to availability.

(ii) The Company shall prepare and inform the Government of Orissa within a short period of time, the water requirement for each phase and the total water requirement for each component. The Government of Orissa will facilitate meeting these water requirements.

(iii) The Government of Orissa will permit implementation of a suitable water supply scheme prepared jointly by the Company and the Department of Water Resources, Government of Orissa. The Government of Orissa will allow the Company to operate and maintain necessary infrastructure including creation of water bodies, laying of pipelines etc. to pump required quantity of water for the development and operation of the Project.

(iv) The Government of Orissa will facilitate the process of obtaining various approvals expeditiously for the Company.

8. **DRAINAGE AND SEWERAGE**

(i) The Government of Orissa shall assist the Company to provide adequate drainage and sewerage off-take facilities for each component project during both the construction and operation stages prior to commencement of construction after following all prescribed procedures and obtaining required approvals.

(ii) The Government of Orissa shall facilitate grant of all necessary approvals for provision of such facilities and the discharge of drainage and sewerage into such facilities.

9. **POWER**

(i) The Government of Orissa have agreed to ensure that about 25 MW of power is made available to the Company to meet the construction power requirements of the steel plant, port, township and also the mining project. During the operation phase, the Government of Orissa will make best efforts to meet the
power requirement of all components of the project including each of its
components.

The details of the requirement of power during the construction phase of the
Overall Project including each of its components and year-wise requirement
thereafter for the operation of the project, will be prepared by the Company
and the Government of Orissa or agency designated by it and will be duly
informed in good time.

(ii) The Government of Orissa will facilitate the execution of an agreement for the
Transmission line from the sub-stations to their project sites, under the
supervision of GRIDCO.

10. CAPTIVE POWER PLANT :
(i) The Company will establish a Captive Power Plant (CPP) to meet the power
requirement in full or part of the overall project including its components.
(ii) The Government of Orissa will facilitate grant of approvals, if any, required for
setting up of this CPP and also execution of necessary Power Purchase
Agreement or Agreement for wheeling of electricity or both, with GRID
Corporation of Orissa or any other agency designated by the Government of
Orissa.
(iii) The Government of Orissa will facilitate the establishment of fuel linkages, if
any, for the CPP.
(iv) The Company will offer to sell any surplus power to GRIDCO or to any other
corporation so designated by the Government at a tariff to be mutually agreed
between the Company and GRIDCO/ any other corporation so designated by
the Government and approved by OERC.

11. ENVIRONMENT:
(i) The Government of Orissa agrees to facilitate and use its best efforts to enable
the Company to obtain a "No Objection Certificate" (NOC) through the State
Pollution Control Board in the minimum possible time for the development and
operation of the Project.
(ii) The Company will conduct a rapid Environment Impact Assessment ("EIA") and
prepare a detailed EIA Report and an Environment Management Plan ("EMP")
for the Project. The Government of Orissa agrees to provide any assistance
requested by the Company during the time the EIA is conducted and the EMP is
prepared.
(iii) The Government of Orissa agrees to use its best efforts to procure the grant of
all environmental approvals and forest clearances from the Central Government
within the minimum possible time for the Project.

12. INCENTIVES AND CONCESSIONS :

(i) The State Government would consider granting to the Company such incentives
and concessions as are provided in the relevant Industrial Policy Resolution
(IPR) in force on this date.
(ii) The Government of Orissa shall recommend to the Central Govt. and facilitate
granting of "Special Economic Zone" (SEZ) status as required by the Company.
This would include granting to the various aspects of the Project, the status of
"SEZ Developer" or "SEZ Unit", as the case may be, so as to receive the same
incentives and benefits as an SEZ (as permissible under the policy of Central
Government).
(iii) If the Company makes an application for setting up its different facilities under the SEZ scheme of the Government of India, the Government of Orissa would recommend their case to the Government of India and accord necessary facilitation with regard to the approved scheme of the Government of India as modified from time to time.

13. **RAILWAYS, ROADWAYS & PORT:**

(1) **Railways:**

(i) The Government of Orissa shall coordinate with the Ministry of Railways to ensure expeditious completion of Daitari – Banspani broad gauge rail link.

(ii) Haridaspur – Paradeep broad gauge rail link is proposed to be developed through public private partnership by the Rail Vikas Nigam Ltd., an instrumentality of the Ministry of Railways. The Government of Orissa will actively pursue with the Ministry of Railways and Rail Vikas Nigam Ltd. for expeditious completion of this project. The Company shall explore the possibility of participating in the SPV for this project. The Government of Orissa shall facilitate all assistance in this connection.

(iii) Banspani – Paradeep broad gauge rail link based on the transportation capacities available and project economics, the Company may develop a dedicated railway line from the site of the Mining Project to the Steel Project. This development may be undertaken by the Company or jointly with RVNL or third parties in consultation with the Ministry of Railways. All assistance in this regard will be provided by the Government of Orissa.

(iv) In this connection, the Government of Orissa shall extend all possible support for securing the cooperation of the Ministry of Railways, East Coast Railways & Rail Vikas Nigam Ltd. etc. to facilitate necessary clearance from the Ministry of Railways.

(v) The Government of Orissa shall facilitate the Steel Project and Mining Project to make appropriate commercial arrangements for use of the railroads mentioned above as per existing laws and procedures.

(2) **Roads:**

(i) The Government of Orissa shall provide all support to facilitate the early completion of the National Highway between Haridaspur (Chandikhol) and Paradeep and for upgradation of the State Highway from Cuttack to Paradeep to a two lane road.

(ii) The Government of Orissa shall actively consider construction of two lane, free access, public roads connecting the Steel Project, the Mine Project and the Integrated Township Development to the nearest National Highway or State Highway.

(3) **Port:**

(i) The Company may:
   a) develop a new minor port adjacent to the existing Major Port of Paradeep and/or,
   b) develop a dedicated berth at the Major Port of Paradeep and/or
   c) make use of the existing port facilities at the Major Port of Paradeep.

(ii) In connection with subparagraphs (b) & (c) of (i) above, Government of Orissa shall facilitate cooperation between the Paradeep Port Trust and the Company.

(iii) In case the Company decides to develop a new minor port, the Government of Orissa will consider granting the Company necessary
permission under its existing policy for development and operation of such a port as per standard concessions prescribed.

(iv) The Government of Orissa agrees to provide all necessary infrastructure and logistic support required for setting up of the minor port by the Company.

(v) Such minor port or berth will be constructed and operated on the basis of BOO/BOOT/BOOST.

(vi) The Government of Orissa shall facilitate drawal of power and water for the port project.

(vii) For this purpose, the Government of Orissa subject to fulfillment of prescribed procedures and requirements shall grant necessary approvals within its power and facilitate grant of all approvals from the Central Government and other relevant agencies including clearance by the Central Government, the Ministry of Environment and Forest under the Coastal Regulation Zone Notification [S.O.114(E)] of 1991 pursuant to the Environment (Protection) Act, 1986.

14. **PROJECT FACILITATION :**

(i) A dedicated High Powered Committee shall be constituted jointly by the Government of Orissa and the Company to ensure that the Project proceeds as per the planned schedule. The High Powered Committee shall include as permanent members, senior officers of the departments of Steel & Mines, Industries, Energy, Water Resources, Works, Commerce and Transport, Forest and Environment and representatives from the Company. The Government of Orissa shall arrange for representatives of other departments to be present for each meeting as required.

(ii) The High Powered Committee shall meet from time to time to review the progress of the Project.

(iii) The High Powered Committee will also have regular interactions with the Chief Minister and the Chief Secretary of the Government of Orissa to apprise them of the progress made on the Overall Project and each component project.

15. **SINGLE WINDOW :**

The Government of Orissa shall establish a special "Single Window Clearance Committee" to ensure clearances under State laws from agencies / departments within specified time limits.

16. **NODAL OFFICER :**

(1) The Government of Orissa shall appoint a senior officer to be the Nodal Officer for the Project.

(2) All applications made by the Company for all relevant clearances, permits, approvals, licenses, consents and the like or facilitation for the Project shall be routed through the Nodal Officer. The Nodal Officer shall diligently pursue the granting of all such approvals/clearances within the minimum possible time and update the Company at regular intervals on the status of these applications.

(3) An Officer reporting to the Nodal Officer would be designated by the Government of Orissa to assist in obtaining necessary approvals from the Central Government as well as its agencies as quickly as possible.

17. **SECURITY :**
The Government of Orissa will take action to provide overall security as per applicable law, as may be required to all parts of the Project during the operation phase. All necessary steps in this regard including setting up of police stations, if required, would be taken by Government of Orissa.

18. **NEXT STEPS**

(i) Immediately following the execution of this MoU, the Government of Orissa shall second (at its own cost) to the Company’s Project office in Bhubaneswar, an Officer of the appropriate level to be dedicated to the facilitation of the Project.

(ii) Within 6 months from the formulation of the Company, (i) a detailed project schedule will be prepared by the Company and submitted to the Government of Orissa, (ii) a detailed implementation plan will be prepared by the Company and submitted to the Government of Orissa and (iii) Agreement will be signed between the Government of Orissa and the Company along the lines of this MoU.

19. **GENERAL CLAUSES**

(i) The Government of Orissa appreciates that the Company will be a responsible corporate house with a high involvement in employees’ welfare and social development. The Government of Orissa, therefore, anticipates that the Company will bring this philosophy to the steel plant project being set up in the district of Jagatsingpur and other district(s) where captive mines linked to the project are located to ensure the well-being of these districts in particular and the people of Orissa in general. In terms of employment, preference will be given to the people of Orissa subject to need and their possessing the necessary qualifications. The Company will make every effort to improve their skill levels, if necessary, through specialized training. For this purpose State Government will nominate a nodal Agency/Officer to coordinate with the Company.

(ii) The Government of Orissa appreciates that the Company will be entitled to induct suitable foreign and/or Indian Joint Venture partners, choose appropriate financial options, suppliers, credit options and technologies in the best interests of the project.

(iii) The Company shall effect sale of all its products in the domestic tariff area (including inter-state sales) in the State of Orissa and shall not effect any branch transfer of its products to out side the State. These stipulations are not, however, applicable to export of finished products outside the country.

(iv) The Company shall comply with all applicable laws and policies of the Republic of India and the State of Orissa including more specifically those relating to environment, mining, rehabilitation and socio-economic development in the periphery of the project and also including the Orissa Government Notification No. 375 dated 15th January, 2004.

(v) The MoU shall remain valid for a period of five years from the date of signing. Further extension, if necessary, shall be made as per mutual agreement. However, no such extension shall be considered unless the Company has made substantial progress on implementation of the project in terms of construction, erection of plant and machinery and investment at site to the satisfaction of the State Government in these five years in implementing the first phase as envisaged in this MoU.

(vi) The Company understands that the offers and special considerations of the State Government indicated in this MoU are for the overall Steel project

2. Later on the State Government of Manipur vide their letter dated 4th April 2007 submitted a revised proposal for diversion of 25,822.14 hectares of forest land (and not 20,464 ha. as submitted earlier) for construction of said project.

3. Details indicated in the said revised proposal submitted by the State Government of Manipur are as below:

**FACT SHEET**

1. **Name of the Proposal**: Diversion of 25,822.14 ha. forest land for construction of Tipaimukh Hydroelectric Project in Manipur

2. **Location**:
   - State: Manipur
   - District: Churachandpur and Tamenglang

3. **Particular of Forests**

<table>
<thead>
<tr>
<th>Name of Forest Division</th>
<th>Area of Forest land for Diversion</th>
<th>Division</th>
<th>Area of Forest land (ha.)</th>
<th>Crown Density</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Legal Status of Forest land</td>
<td></td>
<td>RF</td>
<td>Un-classed</td>
</tr>
<tr>
<td></td>
<td>Density of Vegetation</td>
<td></td>
<td>Southern Forest Div., Churachandpur</td>
<td>2,812.50</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Western Forest Division, Tamenglang</td>
<td>7,237.50</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Jiribam FD, Tamenglang</td>
<td>1,612</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4. **Species wise scientific names and diameter class wise enumeration of trees to be enclosed** (in case of irrigation/hydel project enumeration in FRL, FRL-2 mtr, & FRL-4 mtr, also to be enclosed)

<table>
<thead>
<tr>
<th>Division</th>
<th>Girth Class (cm)</th>
<th>Southern Forest Division, Churachandpur</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>20-50</td>
<td>4,907.74</td>
</tr>
<tr>
<td></td>
<td>50-100</td>
<td>13,556.13</td>
</tr>
<tr>
<td></td>
<td>100-150</td>
<td>10,173.86</td>
</tr>
<tr>
<td></td>
<td>150-200</td>
<td>10,209.09</td>
</tr>
<tr>
<td></td>
<td>200-250</td>
<td>3,050.00</td>
</tr>
<tr>
<td></td>
<td>250-300</td>
<td>574.06</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>41,570.88</td>
</tr>
</tbody>
</table>

**Girth-class wise distribution of species available in the forest land proposed for diversion are as below:**
| Western Forest Division, Tamenglang | 65,005 | 62,110 | 64,952 | 53,333 | 30,990 | . | 12,969,911 |
| Jiribam FD, Tamenglang | 4,254,049 | 3,365,657 | 6,758,272 | 3,450,357 | 1,584,280 | 9,985,756 | 26,563,119 |
| **Total** | **8,349,098** | **7,007,722** | **13,946,244** | **9,249,756** | **4,193,049** | **18,696,985** | **59,533,030** |

Stem density of the vegetation available in the forest land proposed for diversion is 319.39 trees/ha.

5. Brief note on vulnerability of forest area to erosion

**Southern Forest Division, Churachandpur**
Shifting cultivation being practised in the catchment area, the area is quite vulnerable to erosion.

**Western Forest Division, Tamenglang**
Steep slope and fresh cut

**Jiribam Forest Division, Tamenglang District**
The people around the area practice shifting cultivation and the area is vulnerable to soil erosion

6. Approximate distance of proposed site for diversion from boundary of forest

**Southern Forest Division, Churachandpur**
It will submerge a part (more than 30%) of Tolbung Reserved Forests

**Western Forest Division, Tamenglang**
Varies from 0 to 1 km

**Jiribam Forest Division, Tamenglang District**
The proposed area included 1612 ha. of Reserved Forest. Hence the proposed site is within the RF.

7. Whether forms part of National Park, Wildlife Sanctuary, Biosphere Reserve, Tiger Reserve, Elephant Corridor etc. (if so, the details of the area the comments of the Chief Wildlife Warden to be annexed)

No.

8. Whether any rare/unique species of flora and fauna found in the area if so, details thereof.

No

9. Whether any protected archaeological/heritage site/defense establishment or any other important

No
<table>
<thead>
<tr>
<th>10. Whether the requirement of forest land as proposed by the User Agency in col.2 of Part-I is unavoidable and bare minimum for the project. If no, recommended area item-wise with details of alternatives examined.</th>
<th>Yes.</th>
</tr>
</thead>
<tbody>
<tr>
<td>11. Whether any work in violation of the Act has been carried out (Yes/ No). If yes, details of the same including period of work done, action taken on erring officials. Whether work in violation is still under progress.</td>
<td>No.</td>
</tr>
</tbody>
</table>
| 12. Details of Compensatory Afforestation Scheme | Southern Forest Division, Churachandpur

Compensatory afforestation is proposed to be raised in the degraded areas of Dampi, Chekkaphai, and Tolbung Reserved Forest and degraded unclassed forest land in the district at an estimated outlay of Rs. 4,432.45 lakhs.

Western Forest Division, Tamenglong

Compensatory afforestation is proposed to be raised in three compact patches (4200 ha. in Irangmukh RF, 200 ha. in Laimaton RF and 9875 ha. in unclassed forest area) at an estimated outlay of Rs. 3,668.08 lakhs

Jiribam Forest Division, Tamenglong District

Compensatory afforestation is proposed to be raised in the degraded forest areas of Jiri-makru RF, Vanhgai RF & Jiriruk RF at an estimated outlay of Rs. 4,981.42 lakhs. |
| 14. Recommendation | DFO: Recommended
Regional CCF: Recommended
PCCF: Recommended
State Govt.: Recommended |
5. The User agency in part-I of the proposal submitted by them provided following additional information pertaining to the said project:

(i) Tipaimukh HE (Multipurpose) project with installed capacity of 1,500 MW is located 500 m downstream of the confluence of river Tuivai with river Barak near Manipur-Mizoram border by constructing a rock fill dam and a reservoir mostly along the river stream upstream of the dam.

(ii) Total estimated cost of project is Rs. 5,885.00 crore.

(iii) Three alternative sites were studied and reason for abandonment are as below:

(a) 1st site selected at Mainadhar for an earth dam and abandoned in 1996 due to unfavourable geological condition.

(b) 2nd site at Naraindar found not attractive because of submergence of large area of cultivable land in Manipur and partial flood control in downstream.

(c) 3rd site at Bhuvandhar rejected due to soft friable and clayey foundation and submergence of large area of cultivable land villages in Manipur.

(iv) Cost benefit ratio of the project is 1.24 % at 12% IRR, 1.11% at 6% IRR, 1.07% at 4% IRR.

(v) Project is likely to generate regular employment to 826 persons.

(vi) 557 families in 12 villages are likely to be displaced.

6. The Dy. Conservator of Forests, North Eastern Regional office of the Ministry at Shillong inspected the forest land proposed for diversion on 16th March 2008. Important additional information pertaining to the project indicated in the site inspection report submitted by the North Eastern Regional office of the Ministry vide their letter dated 02.05.2008 are as below:

(i). The proposed project (dam site) is located at about 500 Metres downstream of the confluence of River Tuivai (from Mizoram) and River Barak (from Manipur), at 24 14’ N Latitude and 93 13’ E Longitude, near Tipaimukh Village, under Churachandpur District in the State of Manipur near Manipur Mizoram Border. The project is to construct a rock fill dam and a reservoir to generate 1500 MW of electricity together with moderation of annual floods in the plains of the Barak Valley of Assam.

(ii). Item wise break – up details of the forest land proposed for diversion.

a. Reservoir area: 21952.64 ha.

b. Project area
   - NEEPCO colony i/c office complex and stores: 900 ha.
   - Dam i/c contractors camp: 180 ha.
   - Diversion tunnel, spillway, HRT, surge shaft, penstock, powerhouse, switchyard, etc i/c contractors camp: 250 ha.
   - Quarries: 250 ha.
   - Haul Road: 100 ha.
   - Monbahadur road from jiribom to project site: 200 ha.
   - Total: 1880 ha.
c. Land for relocation of road communication system
   • NH-33 between Jiribam and Imphal: 185 ha.
   • NH-150 between Churachandpur to Aizawl: 300 ha
   
   **Sub-total: 485 ha**

d. Land required for Rehabilitation (tentative): 1504.5 ha

**Grand Total: 25,822.14 ha.**

(iii) Proposal involve any construction of building such as NEEPCO colony which will include office complex, residences and stores.

(iv) From the aerial survey, it was observed that a large part of the catchment area is subjected to shifting cultivation. Most of the catchment area is dominated by bamboo vegetation, as such the project area does not appear to harbour significant wildlife. The proposed forest land does not form a part of National Park, Wildlife sanctuary, Biosphere Reserve, Tiger Reserve and Elephant Corridor.

(v) As per the proposal submitted the fauna of the proposed submerged area are reported to include Jungle fowl, Barking deer, Wild Boar, Assamese macaque (Macaca assamensis) Animals such as Leopard (Panthera pardus), Clouded Leopard (Neofelis nebulosa), Slow Lorries (Nycticebus coucang), Golden cat (Felis temmincki), Hoolock Gibbon (Hyllobates hoolock), Capped Langur (Presbytis pileatus), Pangolin (Manis crassicaudata) Hog Badger (Arctonyx collaris), Himalayan Black Bear (Selenarctos thibetanus), etc. and birds like Great Indian Hornbill, Bamboo Patridge, etc. are also reported to have been sighted by the local people.

(vi) The area is basically Sub-tropical ever green or Semi-evergreen forest. Large part of the catchment, including the submergence areas, appeared to have been subjected to shifting cultivation at one time or the other. Such areas are dominated by Melocana baccifera (Mul bamboo). It is also observed that a significant stretch of the bamboo brakes have been affected by Gregarious flowering of muli bamboo and have dried up. Flora of the proposed submerged area include Artocarpus chaplasha, Mesua ferrea, Adina cordifolia, Ailanthus grandis, Albizzia spp. Terminalia myricarpa, Gymnema arborea, Cinamomum spp, Phoebe spp., Michelia champaca, Thamna arundinacea, Salix spp., Musa paradisica, Ficus semicordata, Duabanga sonneratoides, Ferns etc. (Details of trees given in the proposal).

(vii) With the proposed construction of Dam and its subsequent submergence of a vast stretch of vegetation upstream of the rivers, there will be certain adverse impact on the general ecosystem.

(viii) The State Forest Dept. Proposed to undertake CA on double the area proposed for diversion in a degraded forest land (i.e.5164 ha), with an estimated cost of Rs.130,7995 Crores, spreading over three forest diversions as follows:-
(ix) No. of villages consisting of 557 families / households with a population of 2027 of Scheduled Tribes will be displaced. Rehabilitation and Resettlement Plan prepared and reflected in the EIA / EMP report.

(x) Detail field inspection could not be conducted due to security problems and other logistics and topographic difficulties. However most of the catchment areas was covered / observed by aerial survey. The helicopter could land at Tipaimukh Village (located at 93°26′36″ E & 24°23′39″ N under Southern Forest Division) and Kaimai Village (Located at 93°26′37″ E & 24°22′04″ N number Western Forest Division) respectively, hence, on-the-spot inspection of the proposed dam site and the adjoining vegetation was conducted near Tipaimukh Village, as well as the vegetation near Kaimai Village was observed, besides interacting with the local people.

(xi) The submergence area and the entire catchment area of the proposed project is predominantly used for shifting cultivation. However, vegetation along the steep slopes and certain pockets on both sides of the river banks, which appear to be Reserved Forests/proTECTED Forests, are disturbed to a lesser extent. Settled cultivation at certain places along the gentle slope of the river bank as well as human settlement were also observed.

(xii) Bamboo dominates the entire area, though tree vegetation occurs intermittently. The area does not appear to be significant from diversity point of view due to its disturbance by shifting cultivation at this point of time. The area however could recover if left undisturbed or aided natural regeneration can be facilitated. However, detailed report on fauna and flora of the area could be seen from the EIA/EMP report.

(xiii) Should there be any rare or endangered flora in the areas of submergence, the project authorities should set up a Botanical Garden with the help of the State Government or any other agency capable of doing so. Land for such botanical garden should be identified by the project authorities with the help of the State Government.

(xiv) Requirement of a large extent of forest area i.e. 900 ha of forest land for accommodating NEEPCO complex including office, residential quarters and stores etc. needs to be reviewed by the user agency so as to minimize the requirement, keeping in view of the guidelines of Forest (Conservation) Act, 1980. Similarly utilization of forest land for accommodating labour camps as well needs to be reconsidered. Efforts may also be made by the user agency to reduce the land requirement of 250 ha for Quarries. (as the same appears to be on the higher side.

7. The Chief Conservator of Forests (Central), North Eastern Regional Office, Shillong in the said inspection report noted that in his opinion such a diversion proposal involving a huge stretch of critically important forests & wildlife habitat in a state where compensatory measures may not prove to be effective due to problems in effective monitoring & enforcement may not be advisable. But considering the developmental
aspects it is recommended that the Ministry may critically evaluate the utility in terms of
cost benefit of this proposal along with the following additional measures—

(i) The proposal of the State Govt. for taking up Compensatory Afforestation in an
area of 51644 ha degraded forest area spreading over only in the three affected
Forest Divisions does not appear to be logical or practical. Instead, the State Govt.
may propose Compensatory Afforestation to be taken up in the identified
degraded forest land spreading over this small State would ensure effective
implementation as per availability of infrastructure and better maintenance of the
plantation in future.

(ii) Commitment to utilize non-forest land to save forest land is not available, need to
be seriously scrutinized and the proposed requirement of forest area for NEEPCO
Colony (900 ha) Rehabilitation (1504.5 ha), Quarries (250 ha) and Communication
(485 ha) may be reduced or shifted to non-forest area.

(iii) Effective mitigative measures for environmental safeguards would be required to
be implemented as per the detail EIA /EMP report.

(iv) To effectively compensate the wildlife habitat for critically endangered species may
also be examined and stipulated.

8. The Ministry vide its letter dated 23.07.2011 communicated the observation of the Chief
Conservator of Forests, North Eastern Regional Office, Shillong indicated at sl. No. (i) (ii)
and (iv) in para 6 above, to the State Government of Manipur and requested them to
direct the user agency to submit the above information at an early date to enable this
Ministry to place the project proposal before the FAC.

9. The State Government of Manipur vide their letter dated 31.05.2011 forwarded a copy of
the comments received from the Principal Chief Conservator of Forests, Manipur vide
his letter dated 16.04.2011 and informed this Ministry that in view of the comments/
observation of the Forest Department and also keeping in view the utility of the project
vis-à-vis possible impact, the State Government of Manipur recommends the proposal
for diversion of forest land for construction of Tipaimukh Hydroelectric Multipurpose
Project in the State of Manipur subject to fulfilment of the following additional
conditions:

(i) To avoid decrease in effective Forest area/Reserved Forest area of the State.,
additional Non-forest areas in affected districts or adjoining districts shall be taken
up for compensatory afforestation for which funds shall be provided by the user
agency.

(ii) The “Conservation and Management of Biodiversity Plan” to be funded by the
User agency shall be implemented by the State Forest Department.

10. Comments of the Principal Chief Conservator of Forests as contained in his said letter
dated 16th April 2011 are as below:

(i) The proposed forest area for diversion for construction of the said project has been
reduced by the user agency i.e. NHPC from 25,822.14 ha. to 22,777.50 ha. Now the
Division-wise details of revised forest area for diversion are as follows:
<table>
<thead>
<tr>
<th>Legal Status</th>
<th>Western Divn.</th>
<th>Jiribam Div.</th>
<th>Southern Div.</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reserved Forest</td>
<td>37.37</td>
<td>1,612.00</td>
<td>35.53</td>
<td>1,684.90</td>
</tr>
<tr>
<td>Unclassed Forest</td>
<td>7,200.13</td>
<td>6,181.60</td>
<td>7,710.87</td>
<td>21,092.60</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>7,237.50</strong></td>
<td><strong>7,793.60</strong></td>
<td><strong>7,746.40</strong></td>
<td><strong>22,777.50</strong></td>
</tr>
</tbody>
</table>

(ii) Accordingly, the area proposed for Compensatory Afforestation (CA) in degraded forest lands has come down to 45,555 ha. (22,777.50 x 2 = 45,555). As advised by the MoEF, now compensatory afforestation will be taken up in degraded forests of Plantation working Circle of all the 10 (ten) Territorial Forest Divisions as per approved Working Plans. It may be mentioned here that the Working Plans for all 10 (ten) Territorial Forest Divisions have been approved by the Government of India. Further, the State Forest Department would take all necessary measure to ensure successful implementation and maintenance. The details of CA to be taken in all 10 (ten) Territorial Forest Divisions are enclosed.

(iii) However, it is worth mentioning that the construction of the project would affect about 78,16,931 trees in fairly dense Moist Deciduous Forests (3C/C3b) and partly Semi Evergreen Forests (2B/C2) and 0.27 lakh bamboo culms. Thus, despite the compensatory afforestation in degraded forests in all the forest divisions, this vast stretch of forest area proposed for diversion shall be a net loss for State’s forest area as well as forest cover. No compensatory measure would help in mitigating the adverse impact caused by loss of such large forest tracts on the habitat, flora, fauna, biodiversity, micro-climate and environment, unless additional Non-forest areas in affected districts or adjoining districts are taken up for compensatory afforestation.

(iv) As already indicated, the proposed forest area for diversion has been reduced by the user agency i.e. NHPC, from 25,814 ha. to 22,777.50 ha. The user agency has committed to utilise non-forest land for rehabilitation and reduced the requirement forest land for Officer’s colony, Quarries. Now, the details of proposed forest land use are as follows:

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Particulars</th>
<th>Area (in ha.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Reservoir Submergence</td>
<td>21,952.64</td>
</tr>
<tr>
<td>2</td>
<td>Project Area</td>
<td>759.46</td>
</tr>
<tr>
<td>3</td>
<td>Resettlement and Rehabilitation</td>
<td>--</td>
</tr>
<tr>
<td>4</td>
<td>Land for diversion of National Highways</td>
<td></td>
</tr>
<tr>
<td></td>
<td>NH-53</td>
<td>15.60</td>
</tr>
<tr>
<td></td>
<td>NH-150</td>
<td>49.80</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>22,777.50</strong></td>
</tr>
</tbody>
</table>
(v) A map (scale 1:50,000) showing the location and boundary of forest land proposed for diversion is enclosed.

(vi) The "Conservation and Management of Biodiversity Plan" costing about 14.70 crore has been submitted by the user agency. This Plan enlists the large number of endemic, critically endangered and scheduled wild animals, which inhabit both the affected area and catchment area. A copy of the list is enclosed for ready reference. Though, the affected area may not be a part of a notified National Park or Sanctuary, yet it forms a suitable habitat for flourishing wildlife. No management plan would be sure enough in saving the endemic and critically endangered wildlife, once the habitat or its part is lost.

(vii) Keeping in view the utility of the project vis-a-vis possible adverse impacts, the proposal is forwarded for consideration of MoEF, Government of India. In case the project is considered for clearance, the following additional conditions may also be stipulated:

(a) To avoid decrease in effective Forest area/Reserved Forest area of the State, additional Non-forest areas in affected districts or adjoining districts shall be taken up for compensatory afforestation for which funds shall be provided by the user agency.

(b) State Government shall ensure that Deputy Commissioners/Collectors of Tamenglang and Churachandpur districts complete the process for settlement of rights in initially notified Zeilad Sanctuary (falling in Western and Jiribam Forest Division), Jiri-Makru Sanctuary (falling in Western and Jiribam forest Division) and Kailam Sanctuary (Falling in Western Forest Division) under Wildlife (Protection) Act, 1972 within a period of 6 (six) months and final notification is issued before final approval of the project.

(c) The "Conservation and Management of Biodiversity Plan" to be funded by the User agency shall be implemented by the State Forest Department.

(d) The State Government shall fill vacancies of frontline staff and increase their sanctioned strength before final approval of the project to ensure effective implementation of Compensatory Afforestation, Conservation and Management of Biodiversity Plan etc.

11. The Forest Advisory Committee after examination of proposal in its meeting held on 11th - 12th January 2012 noted as below:

(i) The State Government of Manipur initially submitted a proposal to obtain prior approval of Central Government under the Forest (Conservation) Act, 1980 for diversion of 20,464 ha. of forest land which they revised to diversion of 25,822.14 hectares of forest land. Later, in consideration of the recommendations made by the North Eastern Regional Office of the Ministry of Environment & Forests, the area of forest land proposed for diversion was further revised to 22,777.50 ha.;
(ii) Related to the same project, a proposal seeking prior approval of Central Government under the Forest (Conservation) Act, 1980 for diversion of 1551.60 hectares of forest land in Mizoram has also been received by the MoEF and is being processed separately. The Project involves diversion of total 24,329.10 hectares of forest land;

(iii) Forest land proposed for diversion contains 78,16,931 trees and 0.27 lakh bamboo culms. It also harbours several endangered species of flora and fauna. The Principal Chief Conservator of Forests, Manipur has observed in his report that ‘no compensatory measure would help in mitigating the adverse impact caused by loss of such large forest tracts on the habitat, flora, fauna, biodiversity, micro-climate and environment unless additional Non-forest areas in affected districts or adjoining districts are taken up for compensatory afforestation’;

(iv) Area of forest land proposed for diversion is perhaps one of the largest ever for a single project. Per megawatt requirement of forest land at 16.22 hectares of forest land/MW is also substantially high and

(v) As per the State Government, the project which was initially proposed to be executed by the North East Electric Power Corporation Limited (NEEPCO) will now be executed as a Joint venture of NHPC (69%) SJVNL (26 %) and Government of Manipur (5 %).

12. Keeping in view that the project involves diversion of very large area of forest land and felling of more than 78 lakh trees, the FAC recommended that a sub-committee of FAC along with domain experts in the field of ecology, wildlife, hydrology etc. may visit the project site to make an on-the-spot assessment of the impacts, the project is likely to have on flora, fauna and socio-economic conditions of local residents.

13. The FAC further recommended that the sub-committee may also suggest appropriate measures, including reduction in dam height, to minimize requirement of forest land for execution of the project.

14. During a meeting convened by the Cabinet Secretariat to review the progress regarding announcements made by the Prime Minister in 2004 and 2006 and decisions taken on 04.06.2011 in respect of Manipur, it was decided that a representative of the Ministry of External Affairs may also be included as member of the said committee.

15. Accordingly the MoEF vide Order dated 6th February 2013 constituted a five member Committee, with the following composition is hereby constituted, with immediate effect:

(i) Dr. Mohammad Firoz Ahmed, non official member of the Forest Advisory Committee;

(ii) Dr Kashmiri Kakati, Wildlife Conservation Society.

(iii) Dr. Jadish Krishnaswami, ATRRE; Bangalore.

Government of India
Ministry of Environment and Forests

Paryavaran Bhawan
CGO Complex, Lodhi Road
New Delhi - 110 003

Dated: 24.10.2008

Chairman & Managing Director
North Eastern Electric Power Corporation Ltd.
NEEPCO Bhawan
R.G.B. Road
Guwahati: 05

Sub: Tipaimukh Multipurpose HEP Project (1500 MW) in Manipur & Mizoram States 7 Environmental Clearance - regarding.

Sir,


2. The Tipaimukh Project envisages construction of 162.8 h high rockfill dam at about 500 m downstream of the confluence of river Barak with Tuivai. The main objective of the project is to generate 1500 MW hydropower and flood control on 2039 Sq. km. The total land requirement for the project is about 31,950 ha. Out of which 26237 ha. is forest land; private land is 5713 ha.; Total submergence is about 29150 ha (27550 ha in Manipur & 1600 ha in Mizoram). The submergence of forest land in Manipur is 21952.64 ha. & non-forest land is 5597.36 ha. The submergence of forest land in Mizoram is 1489 ha. 557 households consisting of 2027 persons likely to be affected due to this project in Manipur. In addition to that 77 villages will be affected due to land acquisition, No villages will be submerged in Mizoram. Only land of 13 villages will be affected in Mizoram. The total estimated cost is about Rs.6979.44 Crores and the project is to be completed in 87 months.

3. The above referred proposal was considered by the Expert Appraisal Committee for River Valley & Hydroelectric projects in its meeting held on 25.11.2006, 22.2.2007, 15.10.2007, 12.4.2008 and 18.9.2008.

4. The Ministry of Environment and Forests hereby accords environmental clearance as per the provisions of Environmental Impact Assessment Notification 1994 & 2006, subject to strict compliance of the terms and conditions as follows:

**Part A: Specific Conditions**

(i) (a). Catchment Area Treatment Plan (Manipur) as has been proposed should be completed in five years. The plan is given below:
<table>
<thead>
<tr>
<th>Treatment Measures</th>
<th>Year I</th>
<th>Year II</th>
<th>Year III</th>
<th>Year IV</th>
<th>Year V</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>(A) Biological Measures</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Afforestation (ha)</td>
<td>1850</td>
<td>1850</td>
<td>1850</td>
<td>1850</td>
<td>1850</td>
<td>7900</td>
</tr>
<tr>
<td>Horticultural strips Plantations (ha)</td>
<td>250</td>
<td>250</td>
<td>250</td>
<td>144</td>
<td>1144</td>
<td></td>
</tr>
<tr>
<td>Fodder Trees + Pasture Development (ha)</td>
<td>350</td>
<td>350</td>
<td>350</td>
<td>316</td>
<td>1716</td>
<td></td>
</tr>
<tr>
<td>Staggered Trenches (ha)</td>
<td>14</td>
<td>14</td>
<td>14</td>
<td>14</td>
<td>13.46</td>
<td>69.46</td>
</tr>
<tr>
<td>Vegetative hedge (ha)</td>
<td>7</td>
<td>7</td>
<td>7</td>
<td>7</td>
<td>5.7</td>
<td>33.70</td>
</tr>
<tr>
<td>(B) Engineering Measures</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gully Control Structure</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Area to be protected (ha)</td>
<td>1830</td>
<td>1830</td>
<td>1830</td>
<td>1830</td>
<td>8150</td>
<td></td>
</tr>
<tr>
<td>- Loose Boulder Check Dam (Nos)</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>6</td>
<td>22</td>
<td></td>
</tr>
<tr>
<td>- Double Row Post Brush Dam (Nos)</td>
<td>9</td>
<td>9</td>
<td>9</td>
<td>9</td>
<td>45</td>
<td></td>
</tr>
<tr>
<td>Bench terracing (ha)</td>
<td>15</td>
<td>15</td>
<td>15</td>
<td>15</td>
<td>15</td>
<td>75</td>
</tr>
</tbody>
</table>

(b) Catchment Area Treatment Plan (Mizoram) as has been proposed should be completed in five years. The plan is given below:

<table>
<thead>
<tr>
<th>Treatment Measures</th>
<th>Year I</th>
<th>Year II</th>
<th>Year III</th>
<th>Year IV</th>
<th>Year V</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>(A) Biological Measures</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Afforestation (ha)</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>500</td>
</tr>
<tr>
<td>Horticultural strips Plantations (ha)</td>
<td>15</td>
<td>15</td>
<td>15</td>
<td>15</td>
<td>8</td>
<td>68</td>
</tr>
<tr>
<td>Fodder Trees + Pasture Development (ha)</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>21</td>
<td>21</td>
<td>101</td>
</tr>
<tr>
<td>Staggered Trenches (ha)</td>
<td>0.8</td>
<td>0.8</td>
<td>0.8</td>
<td>0.8</td>
<td>0.8</td>
<td>4</td>
</tr>
<tr>
<td>Vegetative hedge (ha)</td>
<td>0.4</td>
<td>0.4</td>
<td>0.4</td>
<td>0.4</td>
<td>0.36</td>
<td>1.96</td>
</tr>
<tr>
<td>(B) Engineering Measures</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gully Control Structures</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Area to be protected (ha)</td>
<td>530</td>
<td>530</td>
<td>530</td>
<td>530</td>
<td>530</td>
<td>2650</td>
</tr>
<tr>
<td>- Loose Boulder Check Dam (Nos)</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td>- Double Row Post Brush Dam (Nos)</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>18</td>
</tr>
<tr>
<td>Bench terracing (ha)</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>5</td>
</tr>
</tbody>
</table>

(ii) The NRRP 2007 R&R package, as well as Governments of Manipur & Mizoram R&R Policy should be followed for R&R of project affected persons. Adequate publicity of the compensation package of NRRP-2007 should be circulated in the affected persons.

(iii) Any common property resources like grazing lands, cremation grounds, religious structures/ places etc. or any existing facilities such as irrigation, water supply, road, electricity, communication system, path etc. be adversely affected due to execution of the project, remedial measures should be taken and incorporated in the project specific R&R Plan. The extent of such measures shall be decided in consultation with the stakeholders.
(iv) Activities would be undertaken for socio economic upliftment for the affected population. This may include special efforts for education like providing scholarships, special efforts and educational facilities for girl child, rural sports, medical camps, other medical benefits as applicable to the PAPs like subsidized treatment at project hospitals etc. depending upon the need and requirement. Such activities would be finalized in consultation and participation of the PAPs.

(v) Educational activities in and around the project area shall be given special focus during the preparation of the PAP. The needs and requirements would be finalized in consultation with stakeholders and may include providing scholarships including those during higher/vocational educational courses like ITI etc organizing training programmes for developing special skills/modern trends in education like computer training, coaching for higher education etc, assistance for nutritional/midday meals etc in addition to infrastructural facilities.

(vi) Efforts would be made for improvement in health facilities to the PAPs. This may include conduction of health surveys, awareness campaigns, assistance to run dispensaries in villages, promotion of alternative and traditional systems of medicines, promotion of national programmes, organizing immunization programmes and other medical camps with focus on marginalised and special groups like SC/ST, women, physically challenged etc.

(vii) In addition to the subsidized treatment being provided to PAPs and their dependants at Project hospitals. Project Authority would also facilitate tying up with the local insurance companies to cover the PAPs through a rural health insurance scheme, for which 50% of the premium of such scheme would be borne by the Project Authority and the balance by the PAPs coming forward to enroll themselves under the scheme.

(viii) Project Authority may also explore adoption of village(s) in the vicinity of the project area to develop them as a Model Village. The facilities could also be developed on the Provision of Urban Amenities in Rural Area (PURAs) concept as detailed by the GOI.

(ix) The commitment made during the public hearing should be fulfilled.

(x) Peak flood estimation by frequency method, utilising a short series of 16 years (1966-1981), when the observed peak is 9100 cumec will lead to a significant increase 1 in 100 year flood estimated as 4931 cumec only. Flood frequency study has to be carried out utilising the data from 1966 to 2007 and got vetted by CWC.

(xi) The inundation map consequent to dam break has to be given due importance in the disaster preparedness and management plan. The project is provided with a spillway capacity much lower than the design flood, because of routing effect. But the earth and rockfill dam has to be safe against overtopping. The dam break flood has been estimated to submerge all densely populated villages and large towns like Silchar going under 3 to 10m deep water. Real time telemetry stations must be established in all important towns linked with the central control station at the dam to be alerted at least 6 to 12 hours prior to the apprehended dam breach. Further arrangement for evacuation be planned out with a flood zoning area and documents kept with district administration. Necessary provision for these activities must be made in the project estimate.
(xii) A special Monitoring Committee including a local NGO should be constituted by MoEF for monitoring the proper implementation of the environmental conditions.

(xiii) An Environmental Cell should be opened within the organisation of NEEPCO to look after the safeguards of Environment Protection of the project.

(xiv) Biodiversity & Wildlife Conservation Plan should be prepared for each RET species separately for rehabilitating them in similar ecological niches and the area should be protected at least for 5 years.

(xv) A detailed Wildlife Management Plan should be prepared in consultation with the State Forest Department considering the fact a large stretch of reservoir will be formed affecting the movement pattern/ corridors.

(xvi) A Monitoring Committee for R & R should be constituted which must include representatives of project-affected persons from SC/ST category and a woman beneficiary.

(xvii) Consolidation and compilation of the muck should be carried-out in the muck dumping sites and the dumping sites should be above high flood level. The proposed plan for 13.61 M cumce of muck disposal i.e. about 2.88 M cum is proposed to be utilized for the construction material and other filling purposes (Rockfill/Coffer Dams, Diversion tunnels, Power House, HRT, Surge Shats, Tailrace, Switch Yard etc.) The remaining 10.73 M cum of muck will be dumped in the 3 designated dumping areas at Sipikawn Saddle Borrow Area, Ronglui Nala-II & Ronglui Nala-III should be strictly implemented.

(xviii) Compensatory afforestation should be done in double the degraded forest area i.e. 51644 ha. in Manipur (51644.28 ha) + Mizoram (3298.20 ha) at Souther Forest Division & Jiribam Forest Division, Churachandpur and Western Forest Division, Tamenglong should be strictly implemented. For compensatory afforestation plan appropriate multipurpose tree species suitably for the area should be selected in consultation with the Forest Department. Gap planting in the degraded area should be done after ascertaining the crown density (not arbitrary). The allocated amount of Rs.13915 lakhs should be utilized for the purpose.

(xix) The proposed green belt within project area along the approach roads, residential areas, Office complex, trench weir and power house site should be implemented and allocated amount of Rs. 842.4 adhered strictly for the purpose.

(xx) The proposed Tipaimukh reservoir fishery in about 22300 ha @ 500 fingerlings per hectare should be adopted and implemented. A nursery proposed to raise the spawns and development of fish farm near project R&R colonies should strictly taken-up in consultation with CIFRI, Barrackpore & State Government so as to improve the fish production from the reservoir and for conserving the project affected fish, including Mahaseer, in the main river as well as upstream & downstream. The proposed amount of Rs. 541 lakhs adhered strictly for the purpose.

(xxi) The proposed 2 Botanical Gardens at Lunghulien village in Manipur and Vanbawng in Mizoram should be taken-up in consultation with State Forest Departments for preserving and protecting unique plants, including RET tree species, hedges, shrubs should be raised and planted in scientific manner following a taxonomic clarification with documentation/ booklet brought out for scientific research and education, endangered and important species.
(xxii) All the equipment which are likely to generate high noise levels are to be fully mollified (noise reduction measures).

(xxiii) Due to construction of the dam, downstream impacts of the project in the State of Assam should be studied.

(xxiv) Reservoirs in tropical countries are a major source of green house emissions. Since the Tipaimukh project involves a large submergence, a comprehensive study of the possible green house emissions from the project should be carried out.

**Part-B: General Conditions**

(i) Adequate free fuel arrangement should be made for the labour force engaged in the construction work at project cost so that indiscriminate felling trees is prevented.

(ii) Fuel depot may be opened at the site to provide the fuel (Kerosene/wood/LPG). Medical facilities as well as recreational facilities should also be provided to the labourers.

(iii) All the labourers to be engaged for construction work should be thoroughly examined by health personnel and adequately treated before issuing them work permit.

(iv) Restoration of construction area including dumping site of excavated materials should be insured by leveling, filling up of burrow pits, landscaping etc. The area should be properly treated with suitable plantation.

(v) Financial provision should be made in the total budget of the project for implementation of the above suggested safeguard measures.

(vi) A multidisciplinary committee in consultation with the ministry should be constituted with Ecologist, Environmental Scientist, Conservationists and experienced administrators etc. to oversee the effective implementation of the suggested safeguard measures.

(vii) Six monthly monitoring reports should be submitted to the Ministry and its Regional Office, Chandigarh for review.

5. Officials from regional Office MOEF, Shillong who would be monitoring the implementation of environmental safeguards should be given full cooperation, facilities and documents / data by the project proponents during their inspection.

6. The responsibility of implementation of environmental safeguards rests fully with the M/S. NEEPCO & Governments of Manipur & Mizoram.

7. In case of change in the scope of the project, project would require a fresh appraisal.

8. The Ministry reserves the right to add additional safeguard measures subsequently, if found necessary and to take action including revoking of the clearance under the provisions of the Environment ( Protection ) Act, 1986, to ensure effective implementation of the suggested safeguard measures in a time-bound and satisfactory manner.
9. The total amount of Rs. 253.68 Crores kept in the budgetary provisions for implementation of environmental management plan should be strictly adhered and not to be diverted for any other purpose.

10. The clearance letter is valid for period of 10 years from the date of issue of this letter for commencement of construction work.

11. A copy of the clearance letter will be marked to concerned Panchayat / local NGO, if any, from whom any suggestion / representation has been received while processing the proposal.

12. State Pollution Control Board / Committees should display a copy of the clearance letter at the Regional office, district industries Center and Collector’s office/ Tehsildar’s office for 30 days.

13. The project proponent should advertise at least in two local newspapers widely circulated in the region around the project, one of which shall be in the vernacular language of the locality concerned informing that the project has been accorded environmental clearance and copies of letters are available with the State Pollution Control Board / Committee and may also be seen at website of the Ministry of Environment and Forests at [http://www.envfor.nic.in](http://www.envfor.nic.in)

(Dr. S. Bhownik)
Additional Director

Copy to:
1. The Secretary, Ministry of Power, Shram Shakti Bhavan, New Delhi-1
2. The Adviser (Energy) Planning Commission, Yojna Bhawan, New Delhi - 110001.
3. The Principal Secretary ( Forests & Environment), Government of Manipur, Imphal ? 795 001
4. The Principal Secretary (Power), Government of Manipur, Imphal ? 795 001
5. The Secretary (Power & Electricity), Government of Mizoram, Aizwal -796 001
6. The Secretary (Environment & Forests), Government of Mizoram, Aizwal -796 001
7. The Member Secretary, Manipur Pollution Control Board, Lamphelpat, Near Imphal West D.C., Office Complex, Imphal ? 795 004
8. The Member Secretary, Mizoram Pollution Control Board, MG Road, Khatla, Aizwal -796 001, Mizoram.
10. The Regional Office, Ministry of Environment & Forests, Shillong, Meghalaya
11. EI- Division, Ministry of Environment & Forests, New Delhi-110003,

(Dr. S. Bhownik)
Additional Director