

**IMPLEMENTATION OF ENVIRONMENTAL  
SAFEGUARDS**

**IN RESPECT OF**

**TUIRIAL H. E. PROJECT (2X30MW)  
MIZORAM**

**PERIOD: October 2016 to March 2017**

**REPORT ON**  
**MONITORING THE IMPLEMENTATION OF ENVIRONMENTAL SAFEGUARDS OF**  
**TUIRIAL HYDRO ELECTRIC PROJECT**

Monitoring Report  
**Part – I**  
**(DATA SHEET)**

1	Project Type: River-valley/ Mining/ Industry/ Thermal/ Nuclear/ Other (Specify)	River - valley
2	Name of the Project	TUIRIAL HYDRO ELECTRIC PROJECT
3	Clearance letter(s) / OM No.& Date	(i) Forest clearance: F. No. 8- 116/92-FC Dtd. 16.03.2000. (ii) Environmental Clearance- No. J-12011/ 21/ 93-IA-I Dtd. 14.06.1995. (iii) Environmental Clearance- No. J-12011/ 21/ 93-IA-I Dtd. 16.10.1996.
4	Location (a) District (b) State(s) (c) Longitudes / Latitudes	Aizawl / Kolasib Mizoram (i) 92° 53.2' E Long (ii) 24° 21.5' N Lat
5	Address of Correspondence (a) Address of concerned Project Chief Engineer (with PIN code & telephone / telex / fax number)  (b) Address of Executive Project Engineer/ Manager (with PIN code & telephone / telex / fax number)	The Head of Project Tuirial H. E. Project NEEPCO Ltd., Mizoram PIN- 796091 Telephone: (03837) 263251 Fax: 03837-263214  Sr. Manager(C), Env /Lot-I/IV Tuirial H. E. Project NEEPCO Ltd., Mizoram PIN- 796091
6	Salient Features (a) of the project (b) of the Environmental management plan	As enclosed in Annexure – I As enclosed in Annexure – II
7	Break up of the Project area (a) Submergence area ( Forest & non forest) (b) Others	5210 ha  170 ha

8	<p>Breakup of project affected population with enumeration of those losing houses / dwelling units only, agricultural land only, both dwelling units and agricultural land and landless labourers / artisans</p> <p>(a) SC/ ST / Adivasis</p> <p>(b) Others</p> <p>(Please indicate whether these figures are based on any scientific and systematic survey carried out or only provisional figures. If a survey is carried out give details and year of survey)</p>	<p>Nil</p> <p>Nil</p>
9	Financial Details	
	(a) Project as originally planned and subsequent revised estimates and the year of prime reference	<p>`41952.13 Lakh</p> <p>`87706 Lakh (Revised at March'10 PL) excluding IDC</p> <p>`133053.11 Lakh (Revised at Dec'15 PL) excluding IDC</p>
	(b) Allocation made for environmental management plans, with item-wise and year-wise breakup	Enclosed in Annexure - III
	(c) Benefit cost ratio / internal rate of return and the year of assessment	-
	(d) Whether (c) includes the cost of environmental management as shown in (b) above	-
	(e) Actual expenditure incurred on the project so far (upto March 2017)	`113604.36 Lakh (Provisional)
	Actual Expenditure incurred on the Environmental management plans so far	<p>`2446.39 Lakh to Forest Dept (Full payment made)</p> <p>+ `4.98 Lakh to Mizoram University for survey of Flora &amp; Fauna</p>
10	Forest Land Requirement	
	(a) The status of approval for diversion of forest land for non forestry use	Approval accorded for diversion of 5380ha of forest land for construction of the project vide MOEF's F. No. 8-116/92-FC Dtd. 16.03.2000.

	(b) The status of compensatory afforestation, if any	Total cost of compensatory afforestation is `1076.00 Lakh which is being executed by Dept. of Env. & Forest, Govt. of Mizoram. Full payment had already been released by NEEPCO to the state Forest Department. The Department certified that they have utilized the amount vide no. B.22013/ 56/ 2013-FC/ PCCF/ 24 dtd. 11.02.2014.
	(c) The status of clear felling	Nil
	(d) Comments of the viability & sustainability of compensatory afforestation programme in the light of actual field experience so far	Dept. of Env. & Forest, Govt. of Mizoram is executing the scheme. The Department certified that they have utilized the amount vide no. B.22013/ 56/ 2013-FC/ PCCF/ 24 dtd. 11.02.2014.
11	The status of clear felling non forest areas (such as submergence areas of reservoir, approach roads)	Nil
12	Status of Construction	
	(a) Date of commencement (actual and / or planned)	07.07.1998
	(b) Date of completion (actual and / or planned)	June 2017-1 <sup>st</sup> unit September 2017- 2 <sup>nd</sup> Unit
13	Reasons for delay (if the project is yet to start)	CCEA clearance for revival of the project has been conveyed on 14.01.2011. Poor Approach Road.
14	Date of Site visit	
	(a) the dates on which the Project was monitored by the regional office on previous occasion, if any	
	(b) Date of site visit for the monitoring report	Multi Disciplinary Committee visited Project Site on 8 <sup>th</sup> April, 2016 followed by a meeting on the same day at Project site.
15	Public appreciation & public complaint on the project.	

**Part-II**  
**STATUS OF COMPLIANCE**

Sl. No.	STIPULATION	ACTION PLAN	STATUS OF COMPLIANCE
I	Adequate free fuel arrangement should be made to labour force engaged in the construction work on project cost. Plan with financial allocation should be submitted within three months.		Provisions were made in the contract agreement for free supply of fuel to the labour force for compliance of the same. NEEPCO is providing free electric power to all laborers & employees against free fuel arrangement.
II	The catchment area treatment plan including green belt around reservoir periphery should be effectively implemented in 7years through engineering and biological measures at project cost. The progress of implementation of plan should be monitored and report should be submitted to the Ministry every six month.	The catchment area treatment plan including green belt around reservoir periphery is prepared for an amount of ₹`1030 lakh. The plan includes afforestation as well as engineering measures. The details of the plan is enclosed in Annex-II & Annex-III.	The catchment treatment plan is implemented through Forest Dept., Govt. of Mizoram. Full payment amounting to `1030.45 Lakh had already been released for implementation of the same. The Department certified that they have utilized the amount vide no. B.22013/ 56/ 2013-FC/ PCCF/ 24 dtd. 11.02.2014 (Copy enclosed).
III	An anti-poaching unit should be established by the wild life wing of state forest department for conservation / protection of fauna and flora of the catchment area at the project cost. The funds should be released to forest department to operate the scheme for five years from the project cost. The progress of the scheme should be reported every six months to the Ministry.	An anti-poaching scheme has been prepared for a cost of `339.74 Lakh to be implemented in 5years for conservation / protection of fauna and flora of the catchment area at the project cost	Forest Dept., Govt. of Mizoram implements the scheme. Full payment amounting to `339.74 Lakh had already been released to Forest Dept., Govt. of Mizoram for implementation of the same. The Department certified that they have utilized the amount vide no. B.22013/ 56/ 2013-FC/ PCCF/ 24 dtd. 11.02.2014.
IV	Health delivery system should be geared up for screening of labour force, which would be engaged for various project work and to prevent out break of any disease. The project authorities would need to interest closely with the State Health Authorities		NEEPCO has constructed a dispensary at project site and has employed a Doctor along with other required personnel. Prevention of Malaria by spraying DDT & Immunization were carried out in guidance of State Health Authorities.

V	Survey of fauna and flora should be continued in the project impact area in consultation with the Botanical Survey of India and Wildlife Warden to study the impact of various activities on the species composition and also to undertake mid-course corrections required, if any for environmental preservation.	An amount of `10.00 Lakh is proposed to be spent to take up the studies.	Department of Environmental Science, Mizoram University, Aizawl is carrying out the survey of Flora & Fauna in Tuirial H.E. project Impact area with cost involvement of `9.96 Lakh. 50% already paid.
VI	Restoration of construction area should be ensured by leveling, filling of borrow pits, landscaping, etc.		The low lying areas, depressions, cavities within the project are being filled up with excavated spoils and adequate care has been taken for restoration of these areas through planned dumping, dressing, leveling and compacting to ensure stabilization, and by grading the surface so as to ease drainage of storm water, etc. Road side drains have been constructed to ensure no water logging. Areas which have potential threat to land slide has been stabilized by construction of retaining wall, breast wall. Inside colony area action for plantation has been chalked out.
VII	A Multi-Disciplinary Committee should be constituted with representatives from various disciplines of Forestry, Ecology, Wild Life, etc. to oversee the effective implementation of the suggested safeguard measures	A Multi-Disciplinary Committee to be constituted to oversee the effective implementation of the environmental safeguard measures	The Multi Disciplinary Committee for TrHEP had been constituted by the Environment & Forest Department, Govt. of Mizoram, vide notification dt. 13.09.2012. One more member is included by the Dept. vide notification dt. 26.02.2013.
VIII	Financial provision should be made in the total budget of the project for implementation of the above suggested safeguard measures		Enclosed in Annex-III All payment made
IX	Six monthly monitoring report should be submitted to the Ministry and its Regional Office at Shillong for review		Monitoring report for the period 01.10.2016 to 31.03.2017 is enclosed

ANNEXURE-I

# SALIENT FEATURES OF TUIRIAL HYDRO ELECTRIC PROJECT

<b>Location</b>	
District	Aizawl/Kolasib, Mizoram
Latitude	24°21.5' N
Longitude	92°53.2' E
<b>Hydrology</b>	
Catchment area	1,861 sq km
Annual Rainfall	2,600 mm, 75% from May to November
Average Discharge	68.8 m <sup>3</sup> / s
Design Flood (PMF)	9,000 m <sup>3</sup> / s
Construction (diversion) design flood (I in 100 year event)	2,900 m <sup>3</sup> / s
<b>Reservoir</b>	
Emergency reservoir level (ERL)	96.5 m asl
Maximum reservoir level (MRL)	95.2 m asl
Normal maximum operating level (FSL)	90.5 m asl
Minimum draw down level (MSL)	68.0 m asl
Gross storage volume	1,400 X 10 <sup>6</sup> m <sup>3</sup>
Live storage volume	715 X 10 <sup>6</sup> m <sup>3</sup>
Reservoir surface area	45 sq km
Reservoir length	85 km
<b>Dam</b>	
Dam Type	Zoned earth fill
Max. height above river bed level	75 m
Dam crest elevation	97.0 m asl
Dam crest length	250 m
Fill volume	30.75 X 10 <sup>5</sup> m <sup>3</sup>
<b>Saddle Dam</b>	
Location	Dugan Lui Valley, 2.5km NE of Main Dam
Dam Type	Earth fill
Max. height above river bed level	20 m
Dam crest elevation	96.6 m asl
Dam crest length	100 m
Fill volume	43,500 m <sup>3</sup>

<b>Spillway</b>	
Type	Radial gated weir, open chute & stilling basin
Design flood (PMF routed outflow)	4.450 m <sup>3</sup> / s
Spillway specific discharge	117 m <sup>3</sup> / s
Crest elevation of ogee weir	76.6 m asl
Number and size of radial gates	3 nos / 10.0m X 14.0m
<b>Diversion Tunnel</b>	
Number of tunnels	2
Invert level	27.0 m
Shape	Modified Horseshoe
Diameter (lined)	8 m
Length	787.8 m (Including Intake Structure)
<b>Low Level Outlet</b>	
Invert level	38.80 m
Size of gates	2mX3m & 2mX3m
Discharge capacity at FSL	200 m <sup>3</sup> / s
<b>Power Tunnel</b>	
Invert level	54.0 m asl
Type of Inlet	Bellmouth
Tunnel shape	Circular, modified horseshoe
Diameter : concrete / steel liner	6.0m & 8.0m / 6.0m, 5.6m & 3.6m
Length : concrete / steel liner	200m / 140m, 80m & 2 nos 30m
Design discharge	131 m <sup>3</sup> / s
Surge shaft	Not required
<b>Power House</b>	
Installed capacity	60 MW
Type of Turbines	Francis, vertical axis
Number and capacity of units	2 X 30 MW
Normal tailwater level (1 unit/ 2 units)	29.3m asl / 30.7 m asl
Maximum tailwater level	48.0 m asl
Maximum gross head (1 unit/ 2 units)	61.2 m / 59.8 m
Minimum gross head	42.5 m
Design Head	53.0m



## SALIENT FEATURES OF ENVIRONMENTAL MANAGEMENT PLAN

### 1. COMPENSATORY AFFORESTATION

Raising of compensatory afforestation in an area of 5380 ha non-forest land against diversion of forest land at a cost of `1076 Lakh is under execution by Dept of Forest, Govt. of Mizoram. The cost of compensatory afforestation is entirely borne by NEEPCO Ltd. NEEPCO had released full payment against the scheme. The Department certified that they have utilized the amount vide no. B.22013/ 56/ 2013-FC/ PCCF/ 24 dtd. 11.02.2014.

### 2. CAT PLAN & ANTI-POACHING SCHEME

The total outlay of CAT Plan is `1030 Lakh and that of Anti-Poaching scheme is `339.74 Lakh. Both the schemes are being implemented by Dept of Forest, Govt. of Mizoram. Full payment had been released by NEEPCO for implementation of both the schemes. The Department certified that they have utilized the amount vide no. B.22013/ 56/ 2013-FC/ PCCF/ 24 dtd. 11.02.2014.

#### Particulars of CAT Plan

Sl. no.	Particulars	Unit	Quantity
	Afforestation	Ha	14220
	Contour ditches	Ha	330
	Gully Plugging	No	430
	Silt retention structures	No	225
	Stream bank erosion control	No	150
	Land slide control	Ha	750
	Cash crop plantation	Ha	120
	Soil conservation plantation in gully head / stream bank / steep slope	Ha	250

### 3. RELIEF & REHABILITATION

There is no affected dwelling house & hence rehabilitation is not required.

### 4. OTHERS

- a) A Multi-disciplinary Committee to be constituted to monitor the progress of implementation of environmental safeguards. The Multi-disciplinary Committee for TrHEP has already been constituted by the Environment & Forest Department, GOM vide notification dtd. 13.09.2012. Meetings of the committee were held on 08.05.2014 & 08.04.2016 at Project Site.
- b) Free fuel arrangements have been made for the laborers in the form of Electric Power.
- c) NEEPCO has deployed medical staff and provided equipments & medicine to take care of worker's health.

**ANNEXURE-III****Financial Outlay & Phasing**

(Rupees in Lakh)

Sl. No.	Item	Phasing (years)	1st year	2nd year	3rd year	4th year	5th year	6th year	7th year	Total
<b>1</b>	<b>CAT Plan</b>									
	A. Afforestation	7.00	130.00	146.00	87.00	87.00	87.00	87.00	87.00	711.00
	B. Soil Conservation measures	7.00	28.50	41.75	47.80	50.00	51.50	51.20	48.70	319.45
<b>2</b>	<b>Environmental Management Plan</b>									
	Enforcement of Anti-Poaching Laws	5.00	143.80	114.29	28.70	26.55	26.40			339.74
<b>3</b>	<b>Compensatory Afforestation</b>	7.00	117.56	231.76	275.50	185.55	100.09	96.64	68.90	1076.00
<b>Grand Total</b>										<b>2446.19</b>

Full payment had already been released