Annexure 4: Terms of Reference (TOR)

මධ්‍යම පරිසර අධිකාරිය

மத்திய சுற்றாடல் அதிகாரசபை

Central Environmental Authority

"පරිසර පියස", 104, ඩෙන්සිල් කොබ්බෑකඩුව මාවත, බත්තරමුල්ල, ශ්‍රී ලංකාව.
"பரிசர பியச", 104, டெனில் கொப்பேகடுவ மாவத்தை, பத்தரமுல்ல, ஸ்ரீ லங்கா.
"Parisara Piyasa", 104, Denzil Kobbekaduwa Mawatha, Battaramulla, Sri Lanka.
Web : www.cea.lk

Sabaragamuwa Provincial Office, No. 27, Vidyala Rd., Kegalle
T.P./Fax 035 2230449

Your Ref.

Our Ref. SA/RN/08/03/Project/04/14

Date 11.06.2014

Director (Administrative)
Bianthura Ela Mini Hydro Power Project,
Erathne Power Company (Pvt) Ltd,
No.37 C, School Lane,
Nawala.

ISSUANCE OF TERMS OF REFERENCE (TOR) -
PROPOSED BINATHURA ELA MINI HYDRO POWER PROJECT (1000kW)
THALAGAHALANDA, KURUWITA IN RATHNAPURA DISTRICT.

Further to the Environmental Scoping meeting held on 19.05.2014 in terms of regulation 6 (II) of the National Environmental (Procedure for approval of projects) Regulation No. 01 of 1993. You are required to prepare an Initial Environmental Examination Report (IEER) of the proposed Binathura Ela Mini Hydro Power Project, Kuruwita in Rathnapura District.

The IEER must address all matters referred to in the TOR. If the IEER fails to address the matters referred to in this TOR it will render the IEER inadequate and you will be required to make necessary amendments and re-submit the report.

Please submit drafted IEER for the purpose of checking for adequacy. Once checked for adequacy, required numbers of copies for the IEER have to be submitted for the purpose of evaluation. The final IEER should be submitted in Sinhala and Tamil languages as well. since the IEER is a public document according to the Evidence Ordinance.

K.P.Welikannage,
Provincial Director,
Sabaragamuwa Provincial Office,
Central Environmental Authority,
Kegalle.

Chairman	[illegible] Director General	Tel : 2872359 Fax : 2872608	Gen. Office	Tel : 28722278, 2873447, 2872777, 280, 2873448 Hot Line : 2888999	Media Unit : 2873449
Deputy Director General-	HRD, Admin & Finance Division Tel : 2865298 Fax : 2872601	Envt. Pollution Control Division Tel : 2873453 Fax : 2873605	Envt. Mgt & Asses. Division Tel : 2872388 Fax : 2872986	Envt. Edn. & Awareness Division Tel : 2872297 Fax : 2872605	
Directors Tel Fax	28[illegible]2607 (Admin) 2872301 (HRD), 2872290 (Finance) 2872601 (Admin), 2863984 (Finance)	2873452 (EIA), 2872606 (Lab) 2882335 (WM)	2872356 (NRM), 2873613 (EIA) 2867264 (R&D)	2863260 (EIA) Fax : 2872609	2872603 (Legal) (Western Province) Tel : 2862631 Fax : 2865294

Final

TERMS OF REFERENCE FOR THE INITIAL ENVIRONMETAL EXAMINATION (IEE) REPORT FOR THE PROPOSED BINATHURA ELA MINI HYDRO POWER PROJECT AT THALAGAHALANDA IN RATHNAPURA DISTRICT

This TOR is valid only for one and half years from the date of issue. the IEE report should be submitted within the validity period.

Project Title	**: Proposed Binathura Ela Mini Hydro Power Project at Thalagahalanda, Kuruwita in Rathnapura District**
Project Proponent	**: Erathna Power Company.**
Project Approving Agency	**: Central Environmental Authority**
Date of Issue	**: 11.06.2014**
Outline of IEE Report	**: Executive Summary**

Chapters

1. Introduction
2. Description of the proposed project and reasonable alternatives
3. Description of the existing environment
4. Description of the anticipated environmental impacts
5. Proposed mitigatory measures
6. Monitoring programme
7. Conclusion and recommendation

Annexes

i. Source of data, information
ii. References
iii. List of prepares including their work allocation
iv. Comments made by the public, NGOs and other agencies during the formal and informal scoping meetings held by the IEE team.
v. Complete set of relevant maps, tables, charts, lay out plans and other details.
vi. Report Obtained from Natural Resources Management Centre (NRMC) regarding soil conservation methods.
vii. Landslide study report from National Buiding Research Organization (NBRO)
viii Terms of Reference

Executive Summary

The summary should be a brief, non-technical summary of the justification of the proposed project, description of the salient features of the project and alternatives considered, the existing environment of the project site and its environs, key environmental impacts, the measures proposed to mitigate the environmental impacts, monitoring programme and conclusions. A one page summary table indicating the significant impacts and proposed mitigatory measures should be presented.

1. INTRODUCTION

This chapter should include the following;

- Background of the project
- Objective of the proposed project and justification of the project
  Summarize the need or problem being addressed by the project and how the proposed project is expected to resolve the problem or the issue.
- Objective of the IEE report
  Specify the objectives of the assessment and the relationship of the results to project design and implementation
- Extent and scope of the study
- Methodologies adopted in report preparation
- The approval needed for the proposed development from state agencies
- Any conditions laid down by state agencies in granting preliminary clearance for the project (Attached copies of approval)

2. DESCRIPTION OF THE PROPOSED PROJECT AND REASONABLE ALTERNATIVES

2.1 Description of the project

2.1.1 Name of the project and project location

Give details on extent of the project area and installed capacity (kW/MW) average annual energy output (Mwh/Gwh).

Indicate the Divisional Secretariat Division/s and the Pradeshiya Sabha area/s within which the project site falls.

State the present ownership of the project site including the transmission line trace/ If state owned, please submit a letter of consent from the relevant state agency.

A location map of reasonable scale (1:10,000 scale is preferred) indicating the project site, accessibility to the site, surrounding developments, transmission line trace, land use and infrastructure.

2.1.2 Drawing showing project layout plan covering the entire project area including all major components of the project including weir, water intake/s, Head race channel, penstocks, power house, tailrace channel, switch yard and related temporary structures etc.
Project layout plan to be drawn on a contour map.

2.1.3 Give a brief description on major components of the project.

Ponding Area

a. Pond area/inundation area with High Flood Level(HFL) should be shown in 1:1000(or higher) Scale countour map.

b. Discribe what is the alternative for the foot path users with in the ponding area due to inundation.

Weir

a. Elevation of the proposed weir showing the existing ground levels, levels of excavation and the crest level, openings and location of the Environmental Flow pipe. (height from the weir crest, diamater.)
b. Cross section and Longitudinial section of the proposed project.
c. Maximum height of the weir.
d. The weir top level in meters above MSL (Bench mark should be demarcated).
e. GPS coordination

Headrace Channel

a. Length, width, height and contour line of the proposed channel.

Fore Bay Tank

a. Overall length length width depth of proposed For bay tank

Penstocks

a. Type, thickness length, diameter & number of lines.

Power Station

a. Type, Sections, Stories, Length and width of the power house.
b. Switch yards, Type of turbines, number of units, Rated speed.
c. GPS coordination and MSL value.

Tail Race Channel

a. Length , width and height of the proposed channel.

Temporary Structures

a. Coffer dams, Contractors and Engineer's site offices, Contractor's store building and store yards, Dumping sites, Temporary quarry sites, Labor camps and access to these structures.

2.1.4 Transmission line

a. Length of the Transmission line
b. Land ownership along the Transmission line
c. Number of trees that will be felled due to the construction activities should be given
(species Name Height in meter and Diameter at breast height(DBH over 10cm DBH trees)

2.1.5 Methodology of construction;

- Material to be used
- Method of installations
- Techniques and equipment to be used.

2.1.6 Site preparation activities
Site preparation, pre and post project construction activities, other construction activities, including temporary structures.

2.1.7 Details of the trees (number and dbh), saplings (number and height) seedlings(number), that are going to be disturbed /removed in the specified area of ,

a. Inundated area due to weir.
b. Path of headrace channel.
c. Path of penstock
d. At power house site.
e. Transmission Line.

2.1.8 Details of any phased development activities and time schedule.

2.1.9 Any infrastructure facilities required /provided by the project (access road etc.).
(Drinking and bathing water facility project should be implemented and proposal should be attached)

2.1.10 Workforce
Requirement and availability (both during construction and operation)
(Priority should be given to nearest people who are living in the project area.)

2.1.11 Investment and funding sources/ state the total cost of the project, the time schedule of the construction period and details of phased development if any.

2,1.12. Detail of existing and proposed MHP projects 1km above the proposed weir location and 1km below the power house location.

2.2 Evaluation of Alternatives

Describe reasonable alternative considered and the basic environmental engineering and economic parameters used in their investigation and evaluation.

The following alternatives could be considered.

- No action alternative
- Alternative site/s,
- Alternative design, technology and construction techniques.

State clearly the reasons for rejecting the alternatives in preference to the recommended site.

3. DESCRIPTION OF THE EXISTING ENVIRONMENT

Study area for this section would be project area and 500 m from the boundary of the project area. This chapter should provide information on physical, biological socio-economic, archaeological and cultural aspects of the environment likely to be affected by any activity of the project during and after the project. Information should be presented in a comprehensive format using tables, maps where appropriate. The methods used to collect data should be clearly stated under each category. All technical terms should be clearly defined. The existing environment should be described under following;

3.1 Physical environment

3.1.1 Topography

Provide concise information on the topography of the study area (attach 1: 1000 scale contour map with 01 meter interval showing all project components including pond area and natural elements such as drainage channels ,landslide prone/erodable ,bedrock exposures and also manmade structures).

3.1.2 Geology

State the general geology of the weir site, ponding area, tunnel/ cannel race, head race, penstock and tail race, to the extent to determine slope stability of the soil and other geo-hazards. Provide a site specific map and the source from where the information was obtained.

3.1.3 Provide concise information about the land use including location of houses within the study area .

3.1.4 Hydrology

- Drainage pattern of the study area
- Mean annual flow of the river
- Mean monthly discharges for a period of 30 years,
- The minimum dry season flow, base flow,
- Water quality of river regime.
- Peak flood discharge for 50,year return periods (describe the analysis used in synthesis of these results)
- Please indicate the approximate level of the highest flood experienced at the site. This may be obtained from the nearby residents and collaborated by any visible indicators at the site. This level shall also be shown in the drawings. (Some data may be available at the Irrigation Department)
- Study report on current flood pattern of the project area and as appropriate above the proposed weir site and how to change the flood pattern due to construction of the weir.
- Flow duration curve (75% probability) with data set.

3.2 Biological Environment:

An assessment of the present ecological status including the biodiversity of the project area. The survey team should identify and map the existing habitats of fauna and flora and their distribution in the study area. Information on endangered, rare, and commercially important flora and fauna and ecosystems existing in down stream of the river. Common name and scientific names of the flora and fauna have to be specified for the study area. This study could be conducted as given in **table 1** attached. Recently published red list and flora and fauna protection ordinance amendments should refer to prepare the lists.

3.3 Social Environment

- Provide information about land cover and land use along the headrace channel/penstock path and path of transmission line. it is necessary to provide current land use along with the information of land ownership/tenure pattern of the lands.
- Significant land use changes (if any) due to the construction of the project should be mentioned.
- Description of the current land use pattern within the project area should be supported by a map preferably 1:10,000 scale.
- Information on land use and land cover should also be provided by a map preferably at 1:10,000 scale in a catchment which drains to Binathura Ela
- River users (Bathing, drinking, agricultural requirements, transportation, commercial purposes and other
- Income generation sources and patterns
- Existing environmental considerations, problems or issues prevailing in the area
- Cultural and archaeological aspects/ considerations
- Existing infrastructure facilities, transportation, communications, power supply etc.

4. ANTICIPATED ENVIRONMENTAL IMPACTS OF THE PROJECT

This chapter should show the overall effects on the individual environmental components. Impacts should include the direct and indirect, long and short-term positive and negative effects. In all cases where an assessment is made it should be quite clear what criteria have been employed to assess impacts.

Impacts shall include the following.

4.1 Soil Erosion and Siltation

4.1.1 Soil erosion and siltation hazards during construction of , penstock, power house, headrace channel, forebay tank, buildings (temporary or permanent) and access road.

4.1.2 River bank and river bed erosion during construction and operation of the project. (If temporary diversion of river for construction of weir is needed. erosion due to such activates should be adequately discussed)

4.1.3 Impacts during rehabilitation of access road to the weir and powerhouse

4.2 Water quality impacts

4.2.1 Impacts on water quality during construction of weir and power house.

4.2.2 Waste generation and pollution from temporary workers camps

4.2.3 Impacts on water quality and quantity at water intakes of drinking water supply schems down stream at the weir.

4.3 Ecological impacts.

4.3.1 Impacts on terrestrial fauna and flora

4.3.2 Impacts on aquatic fauna and flora with special reference to migration of fish species.

4,3.3 Remedies which could prevent the reduction of fish population.

4.4 Impacts on Ground Stability

4.4.1 Due to rock blasting, Cutting and filling of earth for construction of following project elements.
   a) weir
   b) headrace cannel /open cannel
   c) forbay tank
   d) penstock line
   e) power house
   f) access road

4.4.2 Due to blocking of existing natural drainage for construction of open cannel and penstock lines.

4.4.3 Due to removing of existing vegetation cover for the construction activities.

4.4.4 Impact on the existing building and other infrastructures due to construction activities.

4.5 Sociological impacts

4.5.1 Impacts on bathing places and drinking water usage of the downstream
4.5.2 Existing water usage of the downstream
4.5.3 Impacts on land use pattern
4.5.4 Impacts on commercial activities
4.5.5 Impacts on existing cultivation
4.5.6 Impacts due to material transportation
4.5.7 Noise pollution and air pollution due to dust
4.5.8 Impacts on irrigation and flood protection work
4.5.9 Impacts on flooding due to construction of the weir.

5. PROPOSED MITIGATORY MEASURES

This chapter should set out the proposed measures to minimize the impacts identified in Chapter 4 to acceptable levels including conformity to gazetted standards of the CEA. Alternative methods of mitigation should be discussed and the effectiveness of the proposed measures that are to be provided should be stated. Mitigation methods should be defined in specific practical terms. A rationale should also be presented for selection of chosen mitigatory measures.
Special emphasis should be paid on action to be taken to minimize inundation of paddy fields and other land use patterns due to water level rises.A proposal of a catchment protection programme(with estimate) should be attached.

6. ENVIRONMENTAL MONITORING PROGRAMME

A suitable monitoring programme should be submitted to monitor the changes of environment and implementation of mitigatory measures. This plan should include the following;

- Parameters to be monitored
- Frequency of monitoring
- Location / timing of sampling
- Institutional framework for mitigation of impacts
- Responsible agency / agencies of monitoring
- Availability of funds, expertise, facilities

7. CONCLUSION AND RECOMMENDATION

The environmental acceptability of the proposed project and key findings and recommendations of the assessment should be given. The consultants should make a firm recommendation on one of the alternatives based on the findings of the assessment.

Any programme to improve general environmental conditions can also be stated here.

8. This terms of reference for the Initial Environmental Examination (IEE) has been issued by the cea only as a means of providing a guidance for preparation of the IEE for the proposed project. Issuance of Terms of Reference does not anyway reflect an agreement on the part of the CEA regarding the granting of approval for the project.

9. It is responsibility of the project proponent to resolve any issues regarding land ownership prior to embarking on the IEE in order to avoid undue delays. Incase where the project is to be sited on state land we require " in principle" approval of the land owner prior to embarking on the IEE report preparation.

Table 01

STUDY ASPECTS	SITE WITHIN NATURAL FORESTS	SITES WITHIN DISTURBED FOREST OR ABANDONED SITES	SITES WITHIN THE CULTIVATED LANDS
Fauna and flora along the banks of the river	From 50 meters upstream of weir to 50 meters down from the tail race outlet.	From 50 meters upstream of weir to 50 meters down from the tail race outlet.	From 50 meters upstream of weir to 50 meters down from the tail race outlet
Fauna and flora along the rest of the river/stream reservations	Along the line transect for a distance of 60 meters from the bank at 25 meters intervals for the stretch mentioned above.	At reasonable intervals for a distance of 60 meters from the bank. Location for line transect should be determined according to habitat variation and 100 meter gradient contours.	A distance of 60 meters from the bank along 1000 meter gradient contours.
Fauna and Flora in the inundation area.	Up to predicted high flood level.	Up to predicted high flood level	Up to predicted high flood level
Fauna and flora in the spray zone.	Habitat areas within the spray zone	Habitat areas within the spray zone	Habitat areas within the spray zone
Fauna and Flora on the path of headrace , penstock and tail race.	Minimum of 5 meters on either side of the path.	Minimum of 5 meters on either sites at selected locations according to habitat variation and 1000 meter gradient contour along the path.	At 100 meter gradient contours along the path.
Fauna and Flora at power house and other construction sites.	Area covered by the power house and other constructions	Area covered by the power house and other constructions.	Area covered by the power house and other constructions.