

*Bajoli Holi*

114

तार :  
Telegram : PARYAVARAN,  
NEW DELHI

दूरभाष :  
Telephone : & Fax 2436 2827

टेलिक्स :  
Telex : W-66185 DOE IN  
FAX : 4360678

भारत सरकार  
पर्यावरण एवं वन मंत्रालय  
GOVERNMENT OF INDIA  
MINISTRY OF ENVIRONMENT & FORESTS  
पर्यावरण भवन, सी. जी. ओ. कॉम्प्लेक्स  
PARYAVARAN BHAVAN, C.G.O. COMPLEX  
लोदी रोड, नई दिल्ली-110003  
LODHI ROAD, NEW DELHI-110003

J-12011/86/2007-IA.I

11.2.2008

To

Shri. Harvinder Manocha  
Associate Vice President  
GMR Energy Limited  
The Mira Corporate Suites  
Block-D, Second Floor  
1 & 2 Ishwar Nagar  
New Delhi – 110 065

**Subject: Bajoli Holi HEP (180 MW) in Chamba District, Himachal Pradesh –for  
Scoping – regarding**

Sir,

This has reference to your letter no. GEL/BHHEP/MoEF/226/07 dated 29.10.2007 and 1.2.2008 on the above mentioned subject.

2. This proposal was considered during the 9<sup>th</sup> EAC held on 13.12.2007 and 10<sup>th</sup> EAC held on 17.1.2008. The committee noted that the Bajoli Holi HEP is a run-of-the river project located on river Ravi at village Bajoli, District Chamba of Himachal Pradesh to generate 180 MW ( 3 x 60 MW) hydropower. The project comprises of a 33 m high diversion barrage near village Bajoli with an underground desilting arrangement to divert 71.74 cumecs of water through 5 m diameter, 14.6 kms long modified horseshoe shaped head race tunnel with an underground power station near village Holi. The project authority has not yet decided whether a barrage or a dam is to be constructed. This will be finalized at the time of preparation of DPR. The catchment area is 760 Sq. kms primarily consists of 372 Sq. kms snow catchment. No forest land and habitation will be submerged. The total cost of the project is Rs.1000 Crores.

3. The Ministry of Environment and Forests hereby accord clearance for preconstruction activities in the proposed sites as per the provisions of Environmental Impact Assessment Notification, 2006 along-with the following "Terms of Reference (TOR)" for preparation of EIA report.

The EIA report should comprise of general introduction giving details of the project and enlisting salient features of the project. It should also include detailed methodology followed for the analysis of various parameters required for EIA.

- details about the study area like river system, drainage pattern, physiography/geomorphology of the catchment area as well as the project area i.e., the area in the immediate vicinity of the project (within 10 kms)
- Similarly hydro-meteorological aspects are to be covered providing information about the climate profile and water discharge pattern in the river on which hydro-electric project has been proposed. The siltation and sedimentation aspects would also be covered for 3 seasons, in addition to the evaluation of impact on downstream and up-stream projects.

The various details regarding the project layout etc., would be depicted in proper scale maps at least at 1:15,000 like:

- i. Location map of proposed HE project
- ii. Location map of the project area with contours indicating main project features,
- iii. Drainage map of the river catchment up to the proposed project site,
- iv. Soil map of the project area.
- v. Geological and Seismo-tectonic maps of the area surrounding the proposed project site showing location of barrage site, powerhouse site and tunnel alignment, and
- vi. False Color Composite (FCC) generated from satellite data of project area and land-use / land-cover prepared from these images.

The Detailed scope of the study, however, is listed in the following paragraphs.

### Scope of Study

#### **I. For Preparation of EIA Study**

#### Study Area

The study area should comprise of:

- Project area to be acquired for various project appurtenances and area within 10 km from main Project components i.e., Dam/barrage, Power House, etc.,
- Submergence area
- Catchment area for general land-use and terrain characteristics.

#### Baseline Studies

- The baseline studies shall consist of three seasonal field data i.e. Pre-Monsoon, Monsoon and post-monsoon (lean) Season.
- The report would also include Salient Features of the project.

## A. BASELINE DATA

### 1. Geological and Geophysical Aspects

- i. Regional Geology and lithostratographic structure of the catchment
- ii. Critical review of the geological features around the project area
- iii. Impact of project on geological environment
- iv. Justification for location & execution of the project in relation to structural components (dam/barrage height)

### 2. Seismo-tectonics

Seismicity, tectonics and history of past earthquakes in the area based upon IMD data

Study of Design Earthquake Parameters:

A site specific study of earth quake parameters will be done. The results of the site specific earth quake design parameters will be sent for approval of the NCSDP (National Committee of Seismic Design Parameters, Central Water Commission, New Delhi for large dams.

### 3. Hydrology of the basin

- a) Hydro-meteorology, drainage systems
- b) Catastrophic events like cloud bursts and flash floods, if any would be documented based upon secondary data
- c) Sedimentation rate.
- d) Water availability for the project and the aquatic fauna
- e) Design discharge and its recurrence interval.

### 4. Biological Resources

#### i. Flora

- a) Forests and forest types
- b) Vegetation profile, no. of species in the project area, etc. including baseline information for all the plants including orchids.
- c) The details of lower plants viz. Orchids, Bryophytes, Pteridophytes and Gymnosperms present in the project area will be studied/listed
- d) Community Structure in the project area through vegetation mapping
- e) Species Diversity Index (Shanon-Weaver Index) of the biodiversity in the project area
- f) Documentation of economically important plants, medicinal as well as timber, fuel wood, etc.
- g) Biodiversity Index
- h) Endemic, endangered and threatened species, if any in the project area
- i) Impact of impoundment and construction activities on the vegetation
- j) Location of any Biosphere Reserve, National Park or Sanctuary in the vicinity of the project, if any

#### ii. Fauna

- a) Inventorisation of terrestrial wildlife and present status in the project area
- b) Zoogeographic distribution/affinities, Endemic, threatened and endangered species.
- c) Wildlife corridors, if any

## A. BASELINE DATA

### 1. Geological and Geophysical Aspects

- i. Regional Geology and lithostratigraphic structure of the catchment
- ii. Critical review of the geological features around the project area
- iii. Impact of project on geological environment
- iv. Justification for location & execution of the project in relation to structural components (dam/barrage height)

### 2. Seismo-tectonics

Seismicity, tectonics and history of past earthquakes in the area based upon IMD data

Study of Design Earthquake Parameters:

A site specific study of earth quake parameters will be done. The results of the site specific earth quake design parameters will be sent for approval of the NCSDP (National Committee of Seismic Design Parameters, Central Water Commission, New Delhi for large dams.

### 3. Hydrology of the basin

- a) Hydro-meteorology, drainage systems
- b) Catastrophic events like cloud bursts and flash floods, if any would be documented based upon secondary data
- c) Sedimentation rate.
- d) Water availability for the project and the aquatic fauna
- e) Design discharge and its recurrence interval.

### 4. Biological Resources

#### i. Flora

- a) Forests and forest types
- b) Vegetation profile, no. of species in the project area, etc. including baseline information for all the plants including orchids.
- c) The details of lower plants viz. Orchids, Bryophytes, Pteridophytes and Gymnosperms present in the project area will be studied/listed
- d) Community Structure in the project area through vegetation mapping
- e) Species Diversity Index (Shanon-Weaver Index) of the biodiversity in the project area
- f) Documentation of economically important plants, medicinal as well as timber, fuel wood, etc.
- g) Biodiversity Index
- h) Endemic, endangered and threatened species, if any in the project area
- i) Impact of impoundment and construction activities on the vegetation
- j) Location of any Biosphere Reserve, National Park or Sanctuary in the vicinity of the project , if any

#### ii. Fauna

- a) Inventorisation of terrestrial wildlife and present status in the project area
- b) Zoogeographic distribution/affinities, Endemic, threatened and endangered species.
- c) Wildlife corridors, if any

**9. Air Environment**

- a) Baseline Information on ambient air quality in the project area covering aspects like SPM, RSPM, SO<sub>x</sub>, NO<sub>x</sub>
- b) Noise Environment
- c) Traffic density in the project area

**10. Construction Methodology and Equipment Planning including the tunnel driving operations, machinery and charge density, etc.****B. IMPACT PREDICTION**

Impact prediction is a way of 'mapping' the environmental consequences of the significant aspects of the project and its alternative. Environmental Impact can never be predicted with absolute certainty and this is all the more reason to consider all possible factors and take all possible precautions for reducing the degree of uncertainty. The following impacts of the project should be assessed:

- **Air**
  - Changes in ambient levels and ground level concentrations due to total emissions from point, line and area sources
  - Effects on soils, material, vegetation, and human health
  - Impact of emissions DG sets used for construction power if any, on air environment.
- **Noise**
  - Changes in ambient levels due to noise generated from equipment, blasting operations and movement of vehicles
  - Effect on fauna and human health
- **Water**
  - Changes in water quality
  - Sedimentation of reservoir
  - Impact on fish fauna
  - Impact of sewage disposal
- **Land**
  - Changes in land use and drainage pattern
  - Changes in land quality including effects of waste disposal
  - Riverbank and their stability
  - Impact due to submergence
- **Biological**
  - Deforestation and shrinkage of animal habitat
  - Impact on fauna and flora (including aquatic species if any) due to decreased flow of water
  - Impact on rare and endangered species, endemic species, and migratory path/route of animals, if any
  - Impact on breeding and nesting grounds, if any
  - Impact on animal distribution, migration routes (if any), habitat fragmentation and destruction due to dam building activity
- **Socio-economic Aspects**
  - Impact on the local community including demographic changes
  - Impact on economic status

- Impact on human health
  - Impact on increased traffic
  - Impact on Holy Places and Tourism
- 
- Downstream impact on water, land & human environment due to drying up of the river in the stretch between dam site and powerhouse site.
  - Enumeration of Positive as well as negative impacts likely to be accrued due to the project is to be listed.
  - Positive impacts like benefits from carbon trading.

## II. Environmental Management Plan

On the basis of predicted environment impacts, Environment management Plan will be formulated with precise action plans incorporating year-wise physical and financial targets. The EMP shall include the following Action Plans:

### 1. Catchment Area Treatment Plan

Delineation of micro-watersheds in the river catchment and mapping of critically degraded areas requiring various biological and engineering treatment measures. Identification of area for treatment based upon Remote Sensing & GIS methodology and Silt Yield Index (SYI) method of AISLUS coupled with ground survey. The prioritization of watershed for treatment based upon SYI. Spatial Information in each micro watershed should be earmarked on maps in the scale of 1:50,000. The Cat plan would be prepared with year-wise Physical and financial details.

2. **Creation of Green Belt Plan around the Periphery of the Reservoir and Compensatory Afforestation Scheme in consultation with the State Forest department.**
3. **Biodiversity Conservation and Wild life Management Plan** for conservation and preservation of endemic, rare and endangered species of flora and fauna (in consultation with the State Wildlife Department)
4. **Reservoir Fisheries Development** for conservation/management of fishes. Probability of having fish ladder is to be examined in case there is any migratory fish species in the area.
5. **Resettlement & Rehabilitation (R&R) Plan** along with social/community development. For Project affected families who are likely to loose land only, the details on the amount of land taken from them and the land remaining (in case 70% of land of any family is taken, then that family would be counted as a fully affected family). R&R plan would be framed in consultation with the Project Affected Persons (PAPs), Project Authorities and the State Government. R & R Plan would be drafted according to the NPRR 2003 and the policy of State Government.

### 6. Muck Management Plan

7. **Dam Break Analysis & Disaster Management Plan ( In case dam is proposed)**
8. **Restoration and landscaping of working Areas:** reclamation of borrow pits (quarry sites) and construction areas.
9. **Public Health Delivery System including the provisions for drinking water facility for the local community.**

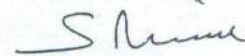
120

10. **Management during the Road Construction**
11. **Sanitation & Solid Waste Management Plan** for domestic waste from colonies and labour camps, etc.
12. **Water and Air Quality & Noise Environment Management during construction and post-construction periods.**
13. **Forest Protection Plan**
14. **Reservoir RIM Treatment Plan**
15. **Environmental Monitoring Programme (With physical & financial details covering all the aspects form EMP).**

4. As per the provisions of the EIA Notification of 2006, you are requested to submit draft EIA/EMP report as per the above terms of reference to the State Pollution Control Board/Committee for conducting the Public Hearing/Public Consultation.

5. All the issues discussed in the Public Hearing/Public Consultations shall be addressed to and incorporated in the final EIA/EMP report and submitted to the Ministry for considering the proposal for Environment Clearance

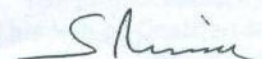
Yours faithfully,



(Dr. S. Bhowmik)  
Additional Director

Copy to :

1. The Secretary, Ministry of Power, GOI, Shram Shakti Bhawan, Rafi Marg, New Delhi-1
2. Principal Secretary (Irrigation & Power), Govt. of Himachal Pradesh, Shimla
3. The Secretary, Department of Environment, Government of Himachal Pradesh, Shimla
4. The Chief Engineer, Project Appraisal Directorate, Central Electricity Authority, Sewa Bhawan, R. K. Puram, New Delhi - 110 066
5. Member Secretary, State Pollution Control Board , Government of Himachal Pradesh, Shimla
6. The Regional Office, Ministry of Environment & Forests, Chandigarh
7. EI- Division, Ministry of Environment & Forests, New Delhi-110003.
8. Guard file.



(Dr. S. Bhowmik)  
Additional Director