

Rajasthan Spinning & Weaving Mills Limited

**Allain Duhangan Hydroelectric
Project: Tehsil Manali, District
Kullu, Himachal Pradesh
Environmental & Social Impact
Assessment**

VOLUME-I (REVISED)

December 2003

Reference I5724

For and on behalf of
Environmental Resources Management

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Signed:



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Glossary

AAQ	Ambient Air Quality	GoI	Govt. of India
ADHEP	Allain - Duhangan Hydroelectric Project	GP	Gram Panchayat
ADM	Additional District Magistrate	GRC	Grievance Redressal Committee
amsl	Above mean sea level	GSI	Geological Survey of India
ASP	Activated Sludge Process	GWH	Giga watt hour
BDO	Block Development Officer	H.P.	Himachal Pradesh
BIS	Bureau of Indian Standards	HPSEB	Himachal Pradesh State Electricity Board
BMWP	Biological Monitoring working party – a methodology use to find saprobic score for biological diversity	HPSEPPCB	Himachal Pradesh State Environment Protection & Pollution Control Board
BOD	Biochemical Oxygen Demand	HRT	Head race tunnel
BPL	Below Poverty Line	HSD	High Sulphur Diesel
CAT	Catchment Area Treatment	ICCS	Indo-Canadian Consultancy Services
CBI &P	Central Board of Irrigation & Power	IFC	International Finance Corporation
CBR	Common Property Resources	IGP	Income Generation Programme
CD	Community Development	IMD	India Meteorological Department
CDO	Community Development Programme	ITDT	Integrated Tribal Development Plant
CDP	Community Development Planning	JFM	Joint Forest Management
CEA	Central Electricity Authority	KVA	Kilovolt Ampere
CERC	Central Electricity Regulatory Commission	LAA	Land Acquisition Act
CIL	Coal India Limited	MoEF	Ministry of Environment & Forests
CLO	Community Liaison Office	MoP	Ministry of Power
CO	Carbon Monoxide	MOU	Memorandum of Understanding
CPCB	Central Pollution Control Board	MT	Metric ton
CPR	Common Property Resource	MW	Mega Watt
CWC	Centre Water Commission	NEAA	National Environment Appellate Authority
DFO	Divisional Forest Office	NEAAA	National Environment Appellate Authority Act
DG	Diesel Generator	NETA	National Environment Tribunal Act
EA	Environmental Assessment	NGOs	Non-Government Organisation
EAP	Environmental Action Plan	NIHL	Noise Induced Hearing Losses
EIA	Environmental Impact Assessment	NOSA	National Occupational Safety Association
EII	Environment Impact Index	NTPC	National Thermal Power Corporation
EMC	Environment Monitoring Centre	OP	Operational Policy
EMP	Environment Management Plan	OSHA	Occupational Safety & Health Administration
EPABX	Electronic Private Automatic Branch Exchange	PAFs	Project Affected Families
EPH	Environmental Public Hearing	PAP	Project Affected Person
ERP	Emergency Resource Plan	PCDP	Public Consultation & Disclosure Plan
ESIA	Environmental & Social Impact Assessment	PGCIL	Power Grid Corporation of India Limited
ESMC	Environmental and Social Management Cell	PHC	Primary Health Centre
ESPP	Environmental and Social Policy and Procedures	PIV	Parameter Importance Value
FCA	Forests (Conservation) Act,	PLIA	Public Liability Insurance Act
FCC	false colour coding	PSU	Public Sector Undertaking
FRL	FullReservoirLevel	R & CD	Rehabilitation & Community Development Cell
G.I	Galvanise Iron	R&R	Resettlement & Rehabilitation

RAP	Rehabilitation Action Plan	SPM	Suspended Particulate Matter
RTES	Rail India Technical and Engineering Services Ltd	ST	Scheduled Tribe
RPII	Relative Parameter Importance Indices	STP	Sewage Treatment Plant
RSWML	Rajasthan Spinning & Weaving Mills Ltd	TLV	Threshold Limit Value
SAR	Sodium Absorption Ratio	TNT	Tri Nitro Toluene
SC	Schedule Caste	ToR	Terms of Reference
SDM	Sub Divisional Magistrate	UN	United Nations
SEB	State Electricity Board	VHF	Very High Frequency
SHG	Self Help Groups	WDC	Watershed Development Committee
SIA	Social Impact Assessment	WEII	Weighted Environmental Impact Index
SPCB	State Pollution Control Board	WPA	The Wildlife (Protection) Act
SPI	Summary of Project Information		

1.1

BACKGROUND

Rajasthan Spinning and Weaving Mills Limited (RSWML), a private limited company incorporated in India, proposes to set up Allain - Duhangan Hydroelectric Project (ADHEP) of 2 x 96 MW (192 MW hydropower generation facility on Allain and Duhangan tributaries of Beas river) in Tehsil Manali, District Kullu, Himachal Pradesh in India. The project is located near village Prini, approximately 3 km SE of Manali town.

In order to narrow down energy supply and demand gap, the Government of India has come out with economic reforms in energy sector by inviting public/private investments and offering a lot of incentives to private entrepreneurs. The government and the state-owned power sector have no alternative but to look for ways of increasing efficiency of the existing electricity generating capacity and augment additional power generation with particular emphasis on hydroelectric power where its potential is high.

In the state of Himachal Pradesh, five perennial rivers Satluj, Beas, Ravi, Chenab and Yamuna flow through and the utility of these rivers though restricted considerably by the rugged and undulating terrain of the State, nevertheless, these rivers possess immense potential for the generation of hydro-electricity. The government plans to introduce a tariff subsidy to support the development of hydroelectric power in an effort to improve the nation's energy mix.

The proposed hydel project has been contemplated as run-of-the-river scheme to utilise the combined discharge of Allain and Duhangan streams, which are tributaries of river Beas in the Kullu district of Himachal Pradesh. The proposed hydel project is expected to be complete by end of year 2008 AD. The proposed project will consist of an underground power plant that would utilise flows from a combination of glacial snow melt and monsoon rains to supply a total storage capacity of 33 ha m via tunnels from catchment basins of the Allain and Duhangan rivers. The setting for the project is the steep terrain of the Himalayas with the diversion structures on the two rivers and an intermediate storage reservoir with a capacity of 0.195 million m³ (requiring a barrage measuring approximately 14.5 m x 261 m). All these facilities will be located above elevation of 2700 m feeding via a 1.69-km steel lined pressure shaft, an 853m-head 2 unit Pelton turbine Power House to be located in a rock cavern. The project will divert a portion of the flow of the Duhangan to the Allain and combine the flows of the two rivers to feed a single powerhouse with 2 units each of 96 MW capacity. A 220 kV power transmission line (of approximately 185km) will evacuate the power to the northern grid at Nalagarh in the district Solan, Himachal Pradesh.

The project has received various approvals including Environmental and Forest Clearances from the Ministry of Environment and Forests (MoEF), Government of India (GoI) as well from state environmental and forest authorities based on the previously done environmental impact assessment and mitigation plan prepared by the Group's in-house consultants. The details of approvals/ clearances obtained for the proposed project are described in detail in *Annex A*.

RSWML is seeking partial financing from the International Finance Corporation (IFC) for the project. To fulfil the requirements of IFC's Environmental and Social Review of the project, more detailed information is required on environmental and social impact assessment, along with specialised studies and a reconnaissance survey for the proposed transmission line corridor, prior to IFC's approval on financing the project.

Accordingly, RSWML has retained ERM India Pvt. Ltd, New Delhi to undertake detailed Environmental and Social Impact Assessment Study including specialised studies to fulfil the IFC requirements in accordance to the requirements of OP 4.01.

1.2

SITE AND SURROUNDINGS

The catchment area of the proposed hydel project lies between the latitudes 32° 07' N & 32° 21' N and longitudes 77° 11' E & 77° 22' E. The project components extend within villages of Pirni, Hamta and Jagatsukh in tehsil Manali in the district of Kullu, Himachal Pradesh. The project lies to the east of the Beas River. The location map of project area and its layout plan are shown in *Figure 1.1* and *Figure 1.2* respectively.

The topography of the region is marked by hilly terrain rising from the altitudes of the 1700 m above mean sea level (amsl) near Beas river (western limits of the catchment area) to 4800 m amsl in the glaciers of Himalyan ranges (eastern limits of the catchment area). The Allain stream is formed by Hamtal and Patroi streams which originate at an elevation of 4680 m amsl and 4800 m amsl respectively in the Himalyan ranges, while Duhangan stream originates at an elevation of 4400 m amsl from Chandratat glacier in the Himalayan ranges. The two streams are joined by several streams and glacier before these empty into Beas river down stream of Jagat sukh village.

1.3

ACCESSIBILITY

The details of the accessibility of the project site can be through road, which is also connected with the rail and air links as per the following details:

Road

The project area lies on the eastern side of the Beas River in the Kullu valley, near tourist town of Manali and is approachable by National Highway NH-21 on Chandigarh - Manali Road (via Chandigarh - Ropar - Kiratpur - Bilaspur - Mandi - Kullu - Patlikuhal - Manali - Pirni village). Access to the project site at Pirni village can be made either from Manali town on Manali-Nagar Road or from Patlikuhal on Nagar - Manali Road. The distances of Manali from Chandigarh are 320 km, from Shimla it is 280 km while from Pathankot it is 330 km.

Rail

The convenient railway links to Manali is either through broad gauge up to Chandigarh, Kiratpur, Una or Pathankot followed by road. The other alternate route

through narrow gauge can be up to Kalka, Shimla or Jogindernagar followed by road.

Air

The nearest airport to Manali is Bhuntar airport located at about 50-km distance. The other linking airports are at Chandigarh and Delhi.

1.3.2

Access to the Project Components

The access to the following project components can be through footpath as presently no connecting roads are available. However, at later stage roads are proposed for connecting various project components as described in the Project description. The major project components include the following:

- Allain barrage site.
- Duhanan weir site.
- Intermediate storage reservoir
- Surge Shaft, Pressure shaft and associated works.
- Powerhouse complex and its associated works including tail race tunnel/channel and switchyard.
- Associated infrastructure (for temporary and permanent residential and non-residential buildings, stores, sheds, water supply, electrification, sanitation, cross-drainage works, fencing etc; required during construction and operational phases).



 Project Area for ADHEP

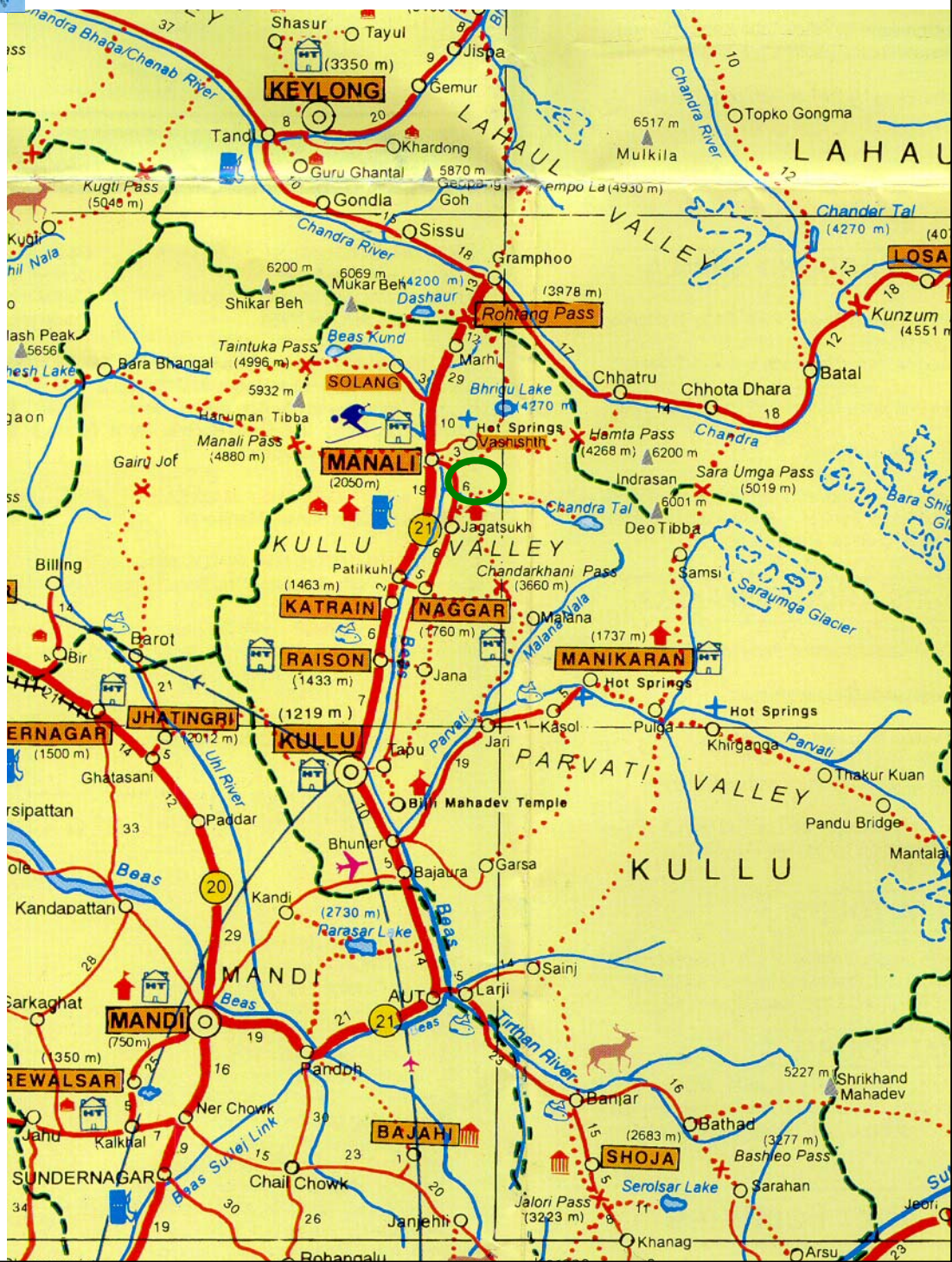


Figure 1.1: Location Map of Allain Duhangan Hydroelectric Project