

## **APPENDIX 4-3**

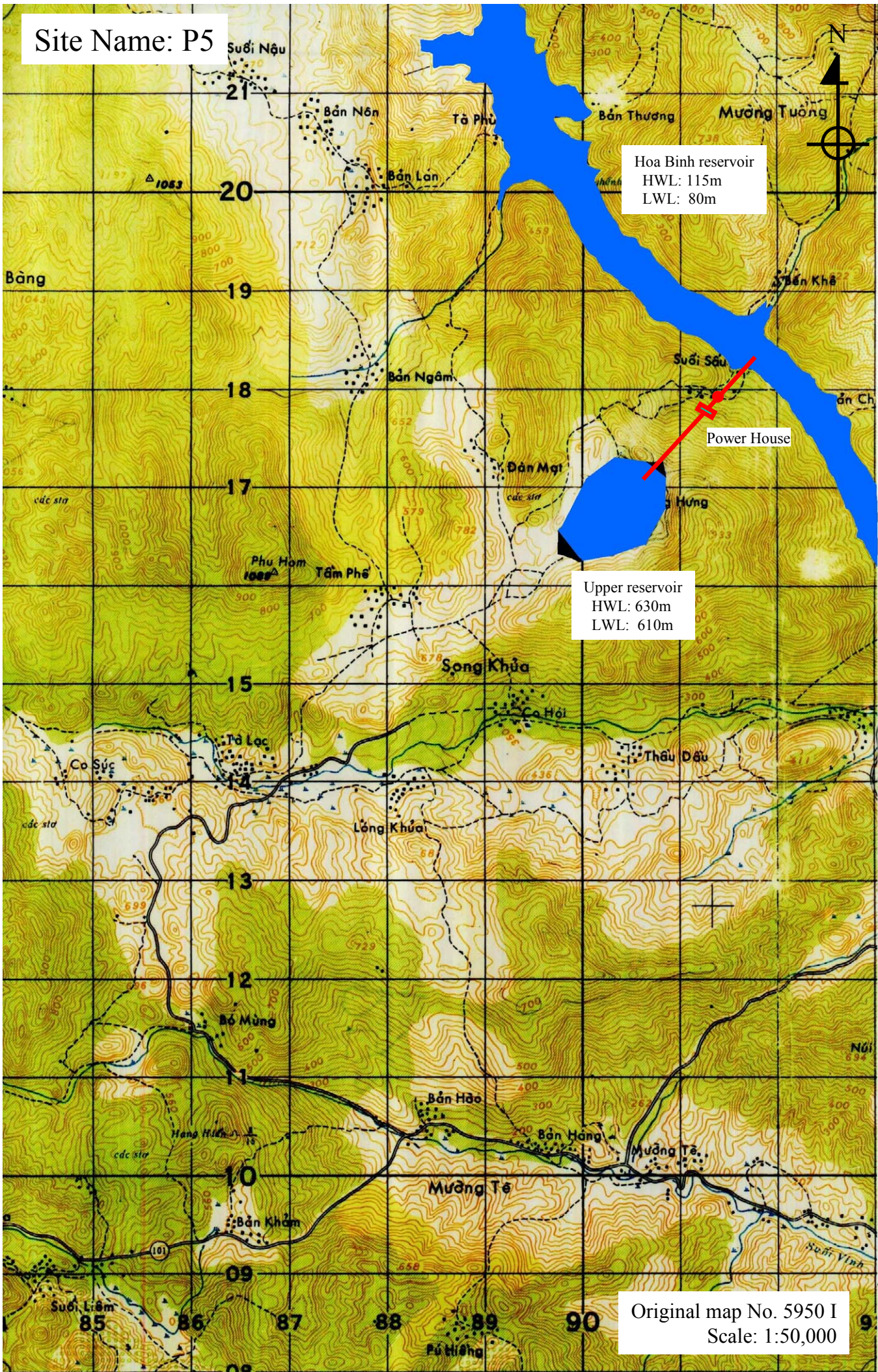
### **Results of the first site reconnaissance**

## The features of promising potential sites for PSPP

Site Name		P 5	
Location (Name of River)		Upper dam/reservoir : Son La Province / Moc Chau District / Song Hung Commune (None) Lower dam/reservoir : Son La Province / Moc Chau District (Hoa Binh Lake)	
Project Parameter	Installed Capacity P(MW)	1,000	
	Design Discharge Qd(m <sup>3</sup> /s)	250	
	Effective Head He(m)	510	
	Peak Duration Time T(hrs)	7	
Topography and Geology	(Overall geological condition)	<ul style="list-style-type: none"> <li>- The surveyed area is regionally around the center of the NNW-SSE systems of folded range group, which continued from the northwestern continental sedimentary rocks of Proterozoic-Paleozoic.</li> <li>- Da River fault as a noticeable tectonic line extends in NW-SE direction and passes the relatively near point as 20km of the surveyed area. One of the branched fault through the upper reservoir.</li> <li>- Sedimentary rocks as dominantly limestones occupy in this region. Along the Da river, there are many of the steep slopes of outcropped limestone in higher level.</li> <li>- Some of the WNW-ESE system of branch faults from the Da River Fault are crossed by the La river in low angle Sedimentary rocks as dominantly limestones occupy the surveyed area in this region. There are many of the special topography by eroded out of the less resistant limestone such as steep valleys or remaining isolated hills.</li> </ul>	
	(Upper dam/reservoir)	<ul style="list-style-type: none"> <li>- Silurian-Ordovician limestone (C2-O1?bk) occupy the upper reservoir site. WNW-ESE system of fault pass through the reservoir from the upper site.</li> <li>- Topography and geology are flat terrace is one of the abnormal forms in this kind of less erosion resistance rock as limestone in this area. There are geological boundary of Cambrian limestone is in the eastern edge of the reservoir, all of the slope to the Da river is occupied by this rock.</li> <li>- The upper dam site can be accessed by a vehicle though Route 6 &amp; 37 about 45 km long from Moc Chau and through the un-paved road about 20 km long from Ban Men.</li> <li>- The poundage constructed by excavation (full facing type) is suitable for this upper reservoir, which H.W.L. will be 620 m based on the topographical condition. The total amount of excavation is presumed to be about 70 percent of the reservoir capacity.</li> <li>- Since a small valley exists in the upstream side of the reservoir, it is necessary to construct the saddle dam.</li> </ul>	

	(Waterway • Power Station)	<ul style="list-style-type: none"> <li>- There are no outcrops between upper reservoir and outlet site, the slope is covered by the grass. But Silurian well-jointed limestone outcropped around the water level in Hoa Binh Lake with 20-30degrees of beddings and 40-60degrees in some locations.</li> <li>- The containing rate of shale in limestone is probably depended on the sedimentation age.</li> <li>- Although the access tunnel to the headrace and the penstock can be approached from the planned upper dam site, it is necessary to construct the access roads and tunnels to the underground powerhouse and the tailrace from Hoa Binh Lake side.</li> <li>- It is thought that a small valley of the downstream of the reservoir is suitable for the location of the outlet. And it is necessary to design the cofferdam and the underwater excavation method for building apron of the outlet.</li> <li>- Since the horizontal distance from Hoa Binh Lake to the underground power station is short, it is necessary for the permeability of the bedrock between them to be low.</li> <li>- It is necessary to construct the pump system for drainage from the underground powerhouse.</li> </ul>
	(Lower dam/reservoir)	<ul style="list-style-type: none"> <li>- Lower Reservoir is Hoa Binh Lake on design, 300m width of Precambrian granite( <math>\gamma</math> PR3bn) is intrude out through the boundary of Precambrian dolomite (PR3sp) and Silurian-Ordovician limestone(C2-O1?bk) in E-W direction extending 5km.</li> <li>- The water level of Hoa Binh Lake was 114 m of H.W.L. mostly.</li> </ul>
Natural and Social Environment	Natural Park / Protected Area	The project site and its surrounding areas are not in any existing or proposed protected area.
	Prosperous fauna / flora	There is no important flora / fauna in the area.
	Minority	There are Muong, Thai, Dao and Kinh ethnic groups living in the area, and it is expected that some of them will receive negative impacts. However, scales of the impacts are unknown.
	Resettlement / Compensatory assets	About 15 households need to be resettled in the upper dam site. Compensation for agricultural land, forest gardens and houses will occur.
	Historical / Cultural Heritage	There is no historical / cultural site in and around the project site.
	Road / Traffic condition	There is a road to the upper dam site but it needs to be upgraded. It is necessary to construct a new one to the outlet and the underground powerhouse.
Others' Special Note		The site is situated about 50 km to Hoa Binh sub-station (500 kV).
Estimated Economic Value		750 mln US\$ (B/C=1.10)

Site Name: P5



Hoa Binh reservoir  
HWL: 115m  
LWL: 80m

Power House

Upper reservoir  
HWL: 630m  
LWL: 610m

Original map No. 5950 I  
Scale: 1:50,000



Photo 1

Un-paved road is not condition after rain.



Photo 2

The poundage constructed by excavation (full facing type) is suitable for this upper reservoir, which H.W.L. will be 620 m based on the topographical condition. (View from the west of the reservoir (EL.620m))



Photo 3

A small valley exists in the upstream side of the reservoir. (View from the west of the reservoir (EL.620m))



Photo 4

It is thought that a small valley of the downstream of the reservoir is suitable for the location of the outlet.



Photo 5

There are no outcrops between upper reservoir and outlet site.



Photo 6

Silurian well-jointed limestone outcropped around the water level in Hoa Binh Lake with 20-30 degrees of beddings and 40-60 degrees in some locations.



Photo 7

Song Hung village in the proposed upper reservoir.



Photo 8

Suoi Ngam village in the proposed upper reservoir.