

Environment and Social Monitoring Report

Semiannual Progress Report
July-December 2005

LAO PDR: GMS Nam Theun 2 Hydroelectric Project

Prepared by the Environment and Social Division of Nam Theun 2 Power Company, Ltd.

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NAM THEUN 2 POWER COMPANY LTD

**Environment & Social
Progress Report**

Period Jul 2005 to Dec 2005

This report is a revised version of the Semi-Annual Progress Report, July to December 2005, produced by the E&S Unit of Nam Theun2 Power Co. Ltd. The report has been edited for public release.



Nam Theun 2 Power Company Ltd.

Nam Theun 2 Hydroelectric Project

Semi-Annual Progress Report

Period July to December 2005

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DEFINITIONS AND ABBREVIATIONS

MAP OF PROJECT SITE

MAP OF VILLAGES RELOCATION ROUTE

PREFACE

Purpose of this report

The purpose of this document is to provide the wider audience with a comprehensive and transparent report on the Nam Theun 2 Project progress against its overall implementation planning.

Overview of the scope

The scope of this report includes description of the Project implementation progresses in the field of construction, environmental management during construction, Public health programmes and social development throughout the various Project areas except the watershed, which is managed directly by the Government of the Lao PDR (GOL). It also describes the activities related to wildlife programmes, archaeological surveys and water quality monitoring of the various rivers affected by the Project.

Who prepares it?

This report is prepared by NTPC. Prior to its disclosure to the wider audience, it is reviewed and commented by the GOL, lenders and International Financing Institutions involved in the Project.

Relationship to other NT2 related activities by the Government

While NTPC is in charge of preparing the progress report on the above mentioned topics, GOL prepares a consolidated progress report including the description of the conservation and development activities that the Watershed Management Protection Authority (WMPA) is undertaking in the Nakai-Nam Theun National Protected Area (NPA), as well as elements of progress in the establishment of the revenue management scheme that the Ministry of Finance is coordinated with the rest of the national public administration.

1 EXECUTIVE SUMMARY

The completion of the Project financing occurred on 15 June 2005. It allowed NTPC to finalize the organization of the company both in Vientiane and at the site, in order to:

- Monitor the construction activities by the Head Contractor, including the establishment of appropriate measures for environmental management
- Perform recurrent water quality monitoring
- Perform advanced UXO clearance and archeological surveys and/or salvage prior to the transfer of required lands to the constructors
- Further establish the communications channels at the local level to:
 - (1) perform appropriate compensation to the villagers that are the most directly affected by the construction ("Project lands")
 - (2) continue the participatory process for the implementation of the resettlement and social development measures in the downstream areas.

During the period, international stakeholders and the Public have largely participated and could witness this process, and numerous site visits and discussions have been conducted for that purposes.

1.1 CONSTRUCTION ACTIVITIES

The financial Close of the Project allowed NTPC to move into full scale construction activities. Prior to that, Preliminary Construction Activities (PCA) had been ongoing since mid-2004. Such PCA have been critical to prepare some ground works, access roads as well as the overall management organization for the Project construction.

Thus, despite the adverse weather conditions and difficulties of access to sites during first half of the period, excavation and tunneling works have progressed substantively, and power station excavations have been completed. Substantial works were undertaken at the Nakai Dam site, and external excavations at the water intake on the edge of the Nakai Plateau were completed. Heavy rainfall events during much of July to September 2005 have affected progress of the works in a number of areas. This resulted in increased water levels of the Nam Kathang and high water levels in the Nam Theun, and access roads have been occasionally flooded. With the dry season, fine whether returned in October and the construction delays that had occurred during the rainy season could be mitigated. In particular:

- **Dam Site:** Difficulties with access to the site, land slip and flooding of the diversion tunnel inlet and outlet portal areas have prevented progress of the works at the Nakai Dam site during most of July to September. Some works could however been undertaken, including slope stabilization above the diversion tunnel inlet area. The end of the rainy season allowed making up the slight delay and, by December, the Nam Theun river diversion tunnel excavation was almost completed.
- **Headrace tunnel and power conduit:** The Headrace Channel adjacent to the Power Conduit Water Intake continued, along with preparations (including equipment mobilization) for commencement of Headrace Tunnel excavation works in October 2005. The Access Adit to the Headrace Tunnel was completed. Excavation of Pressure Tunnel and Drainage Tunnel reached approximately 50 % of the total respective lengths of each tunnels.
- **Power Station:** Power Station excavation works to the bottom elevation were completed. Earthing cable installation was done in conjunction with the final excavation works. Concreting works have been started.

- **Regulating Dam and Downstream Channel:** Downstream Channel soil investigations and UXO clearance for the channel alignment have progressed, though these activities were severely restricted by the persistent heavy rain and by floodwater during the first half of the period.

1.2 ENVIRONMENTAL AND SOCIAL DEVELOPMENT ACTIVITIES

While preparations have occurred for the later implementation of all tasks associated with the environmental and social development activities of the Project, tangible activities were undertaken during the period in the field of:

- Health programmes at the local and provincial levels
- Project lands, of which physical cultural resources surveys and salvage and impacted villagers compensation
- Resettlement and community development activities on the Nakai Plateau
- Environmental management of the construction including water quality monitoring,
- Asian elephant programme

(a) Health programmes

NTPC Health Team has been fully established. Main activities for the period included workshops on road safety, GOL Ministry of Health staff training, refining activity plans with District and Provincial staff as well as monthly meetings with the GOL.

Over this period, infrastructures were developed (construction or rehabilitation of Health centers), medical and non-medical supplies were provided (including vehicles), additional health staff were recruited and formed, and the public health monitoring system has been designed and is being progressively put in place.

(b) Physical Cultural Resources, Project lands, Camp Followers

Before handing over the construction areas required for the construction to the Head Contractor, NTPC, jointly with the GOL, has been implementing:

- Physical Cultural Resources surveys and protective measure whenever required.
- Land survey and payment of compensation to affected people

In particular, the necessary preparation were done to relocate and compensate about 50 families within the Oudomsouk village in early 2006, before handing over the required land for the construction of a saddle dam. Programmes for the restoration of livelihood for the Oudomsouk Project Affected People (PAP) have been prepared and will be undertaken by the INGO. Before such restoration is fully implemented over time, affected people will receive provisional compensation.

(c) Preparation activities for resettlement

Building the capacity of both NTPC and GOL resettlement team has been a priority during the period. At NTPC level, all the required staffs are now onboard. At the Government level however, some delays have been experienced, in particular with respect to the staffing of RMU, but these delays have not significantly affected progress as NTPC staff could counter-balance to some extent until RMU is fully staffed and functioning.

Pre-resettlement activities progressed well throughout the period, although from July to September, these were rendered highly difficult by the heavy rain and lack of all-weather roads. The activities focused in particular on the two villages situated at the northern edge of the future reservoir, namely Sop Hia and Nam Nian, which are part of the village group 1 (VG1) as these villages will potentially be the first ones to be impacted by higher water level during the next rainy season, once the coffer dam protecting the construction of the Nakai dam is constructed. Furthermore, the decision was taken to regroup both VG1 and VG2 into

a single planning for resettlement. The rationale for regrouping lies in the needs for more preparation, and the decision was taken in close consultation with stakeholders involved. More generally, preparation activities during the period included:

- population census,
- topographic survey and mapping of indicative locations
- community consultations on villages location and village layouts
- development of preliminary livelihood models and animal registration. These activities have been progressing well with more detailed agro-ecological mapping of the Nakai resettlement area undertaken, along with ongoing consultations with villages.
- design of infrastructures (domestic water supply and sanitation, irrigation systems, electrical grid, roads)
- design and call for tenders for housing, including household sanitation facilities

More specifically, NTPC resettlement team has been focusing some of its efforts, including design and procurement activities, on the Relocation Action Plan for Oudomsouk, where people affected by the construction of a saddle dam will need to be resettled.

In the Nong Boua Pilot resettlement village, substantive progresses have been made in the completion of community building, of which the primary school that is now used as the main district school awaiting the establishment of other schools as planned in the resettlement programme.

(d) Environmental management

The main activities of NTPC during the period have included the following:

- Environment team continued its work with programmes and monitoring of construction activities. These activities led to the improvement and tuning of environmental management measures, such as waste management and at the various sites by construction contractors.
- The Water quality sampling is well underway though access constraints delayed the sampling event to August. Generally, water quality was strongly influenced by the heavy rainfall experienced in the Project area prior to some sampling event. No significant anomalies in ambient water quality resulting from project activities were detected during the first half of the period. The impact of the works on water quality continued over the remaining of the period and efforts made to improve preventing measures (including sedimentation ponds).
- The wildlife programme procurement activities started in early September following international procurement rules. Expressions of interest for the various components of the wildlife programme (including phase 2 of the elephant programme) have been received. The elephant programme, launched in March 2004 is ongoing, and a first report was produced by the Wildlife Conservation Society (WCS) in November. The first phase of the programme with WCS has been extended to March 2006.

1.3 MAIN ISSUES ENCOUNTERED AND RESPONSES PROVIDED DURING THE PERIOD

Heavy rain and flooding that have occurred during the period have perturbed access to villages on the Nakai Plateau, thus slightly delaying the overall community development and consultation programme. NTPC is making up these delays by increasing the frequency of consultations during the dry season.

Occasional concerns regarding the construction have been signified by villagers to NTPC through the grievance mechanisms in place (see section 4.6). Such concerns have been mainly related to the ongoing construction activities and appropriate corrective measures have been taken by either NTPC or its contractors to resolve the issues.

1.4 MONITORING AND STAKEHOLDERS VISITS**(a) Independent monitoring Activities**

During these first six months of the Project implementation, the organization of external monitoring of NTPC and GOL has been a priority for all parties and especially for International Financing Institutions (IFI) and commercial lenders involved in the Project. Accordingly, the period was marked by the following monitoring events:

Month	Event
June	Project Launch Workshop and site visit by Project lenders
July	Quarterly visit of Lenders' Engineer
	IFI technical review mission
August	Joint POE and IAG Site Visit
September	Site visit by lenders representatives
	Quarterly visit of Lenders' Engineer
October	IFI technical review mission
November	Site visit by AFD
	Quarterly visit of Lenders' Engineer

(b) Project partners monitoring activities

In addition to the external monitoring by lenders and contractual entities and to the internal NTPC monitoring, the Government, EGAT, and NTPC's shareholders are conducting regular review missions on various topics. Activities during the period are summarized below:

Month	Event
June	Site visit by EPPO - Ministry of Energy of Thailand
July	Site visit by Minister of Health of the Lao PDR accompanied by the French Ambassador
	Site visit by the Prime Minister of the Lao PDR accompanied by Minister of Industry
August	Site visit by Lao Ambassadors based abroad
	Sit visit by the Lao Committee for Planning and Investment
	Site visit by the members of the Ministry of Interior of the Lao PDR
	Site visit by the Governor of Khammouane province
	Review mission by NTPC's Shareholders
	Site visit by EDF Strategy Department
October	Site visit and review mission by NTPC's Shareholders
	Site visit by EGAT
November	Construction cornerstone ceremony chaired by Prime Minister of Lao PDR, Prime Minister of Thailand, and Ambassador of France
December	Site visit by insurers

(c) International Stakeholders Activities

NTPC and GOL are encouraging civil society, academics, parliamentarians and members of the international media community to regularly visit the Project. The following table describes such activities during the period:

Month	Event
September	Site visit by members of the French Parliament
September	Visit to NTPC by members of the Japanese House of counselors
October	Site visit by World Bank Vice President for External Affairs, Communications & UN Affairs
October	Site visit by a Senior Officer of the UK Department For International Development (DFID)
November	Site visit by IMF
	Site visit by advocacy NGO IRN, Environmental Defense, Mekong Watch
	Site visit by NGO World Society for Protection of Animals
	Site visit by NGO
	Site visit by several groups of free-lance media and post-graduate students

Members of the civil society and media are expected to further visit the site during the dry season. NTPC will host public tours to the Nam Theun 2 Project twice a year for one week each time, in November and April. Outside these two periods, the access to the Nakai Plateau and its villages remain open to the public at all time. However, for safety and work progress reasons, there are some restrictions to access some construction areas.

(d) Summary of POE/IAG findings and recommendations

Finding and recommendations related to NTPC activities (<u>ref. Report of August 25, 2005</u>)	Project responses during the period
Dam labor Camp: POE/IAG accepted NTPC plans to locate the camp site for the labor on the dam at the dam site itself but recommended that any camp followers be located in the town of Lak Sao. POE/IAG also asked to add a camp rule provision forbidding "hunting and collecting, buying and selling of wildlife and non-timber forest products." The camp shall be constructed with a view to later use some of its infrastructures for tourism. Re-vegetation should occur as well as attention to avoid forest clearance along what will become the shore of the reservoir.	NTPC has implemented the construction camp at the dam site accordingly. All staffs contracts have a clause strictly forbidding wildlife consumption, hunting and trading.

Finding and recommendations related to NTPC activities (<u>ref. Report of August 25, 2005</u>)	Project responses during the period
<p>Nakai Plateau Resettlement: NTPC to be appointed as a member to the Resettlement Committee. GOL or NTPC to recruit a full time social scientist with extensive development-induced resettlement experience.</p> <p>The VG1 resettlement schedule for June 2005 - May 2006 is viewed as especially tight and more complex than for VG2. POE/IAG recommended that activities by village be scheduled as soon as possible while Oudomsouk and Ban Nam Pan resettlement be dealt with separately. POE/IAG also suggested staggered site development and village removal.</p>	<p>Both appointment and recruitment were made during the period.</p> <p>NTPC realized that POE skepticism regarding VG1 resettlement schedule was well founded and therefore decided to re-think the schedule and move both groups of villages (VG1 and VG2) during the same period, therefore allowing for better preparation and completion of all the required resettlement infrastructures and livelihood options.</p>

2 PROJECT DESCRIPTION

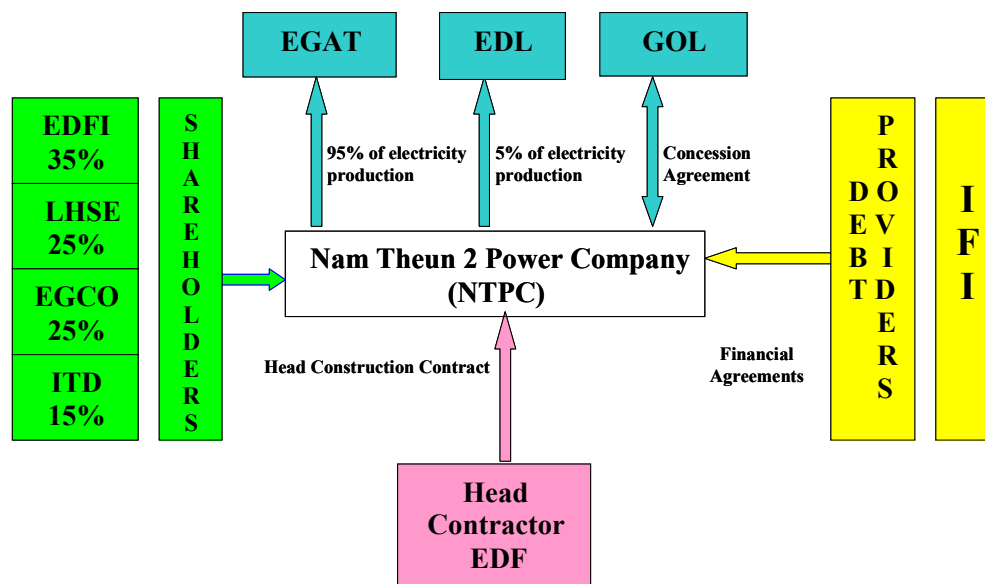
The potential for hydroelectric power projects on the Nam Theun River was first identified in the mid-1970s and was the subject of detailed studies during the following decades. It was not until the early 90s that the Nam Theun 2 hydroelectric project ("NT2" or the "Project") was specifically recognized by the Government of the Lao PDR (GOL) as a key project for the economic and social development of the Lao nation. With the introduction in 1994 of sponsors Electricité de France (EDF) and Italian-Thai Development Public Company Limited (ITD) of Thailand, and the invitation to the World Bank to participate in the project, NT2 moved from a concept to a development phase. Its design and preparation of a complete set of economic, environmental and social safeguards have taken more than ten years. A temporary delay caused by the Asian financial crisis of 1997 allowed the sponsors, which by 2000 also included Electricity Generating Public Company Limited (EGCO) of Thailand, to update some of aspects of the Project, and to develop an adjusted structure best suited to the requirement of commercial lenders. This finally led to the successful Project financing and subsequent beginning of full construction activities in June 2005.

2.1 CONTRACTUAL ARRANGEMENTS AND FINANCING

NT2 is the fourth hydropower project located in Laos that sells substantially all of its electricity availability to the Electricity Generating Authority of Thailand (EGAT) on the basis of a long term Power Purchase Agreement (PPA). The earlier developments were more modest in scale, with about 500 MW in combined capacity, but had established the viability of such a development model for Laos.

The Project is owned by the Nam Theun 2 Power Company (NTPC), a limited company incorporated under the law of the Lao PDR. NTPC will build, operate and then transfer the Project free of cost to the Government at the end of a 25-year operation period. NTPC's shareholders are:

- 35% EDF International (EDFI), a wholly owned subsidiary of Electricité de France
- 25% the Lao Holding State Enterprise (LHSE), owned by the Government of the Lao PDR
- 25% Electricity Generating Public Company Limited (EGCO) of Thailand
- 15% Italian-Thai Development Public Company Limited (ITD) of Thailand



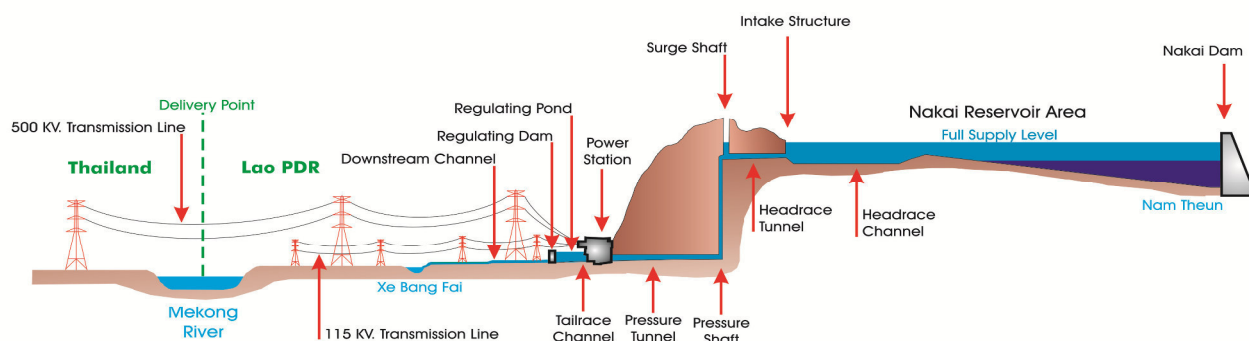
The Project is being implemented by NTPC in the framework of the Concession Agreement (CA) with the Government of the Lao PDR. International Financial Institutions (IFIs) and commercial lenders are contractually involved in the Project via a series of financing agreements among the Parties.

A total of more than US\$ 1,500 million in capital commitments for NTPC has been completed in May 2005 to finance the total base Project cost of US\$ 1,250 million, plus additional amounts for contingency and ancillary bonding facilities. In addition to senior loans facilities, shareholders complete the Project financing by contributing equity pro-rata their respective participation in NTPC. The equity contribution of LHSE is financed by means of loans, grants and other financing from institutions including the AFD, ADB, European Investment Bank and the World Bank.

While the CA established that NTPC and GOL have a joint responsibility for the proper implementation of E&S measures, NTPC has a full responsibility vis-à-vis its main customer EGAT for the construction on time of the power generation facilities. However, NTPC has passed most of its responsibilities for such timely completion of the scheme to EDF, through the Head Construction Contract which establishes that EDF shall construct the Project on a date certain, fixed price turnkey basis.

2.2 TECHNICAL DESCRIPTION

NT2 is a 1,070 MW trans-basin hydropower scheme diverting the upper flow of Nam Theun river from the Nakai plateau into the Xe Bangfai River in the Khammouane plain. By such the project is benefiting from a 348 m net head to drive generating units capable of producing an average 5,936 GWh per year.



The Project is being built on the Nam Theun River, a tributary of the Mekong. The key features of the Project include:

- a 39m high, 436 m long, concrete gravity dam with integrated spillway;
- a 450 km² reservoir (at Full Supply Level) and active storage of 3,530 million m³;
- a catchment area of 4,039 km²;
- an average net head of water of 348 m;
- a powerhouse comprising 4 x 250 MW Francis turbines (for supply of power to EGAT) and 2 x 37.5 MW Pelton turbines (for supply of power to EDL);
- a double circuit 115 kV transmission line to Mahaxai in Laos;
- a 138 km long double circuit 500 kV transmission line to the Thai border; and
- a 160 km long double circuit 500 kV transmission line from the Thai border to Roi Et (to be built and funded by EGAT).

The Project's location is much favorable for a large-scale, world-class hydroelectric power facility. The natural geography of the Nakai Plateau and the surrounding area is unique in that it allows a hydroelectric project with a significant head of water without a corresponding requirement for a high dam.

2.3 BENEFITS TO LAOS

Nam Theun 2 is a major milestone in the economic development of Laos. The project will export 95% of its electricity to Thailand in the framework of the 25 year PPA between NTPC and EGAT, 5% of electricity will be delivered to Lao grid. Laos will receive almost US\$ 2 billion of cash revenue over the concession period (from royalties, taxes and dividends). This revenue will be used to reduce poverty and assist long term development in Laos through a carefully designed revenue management programme.

With the US\$ 1,250 million base financing for the Project, NT2 will be the largest economic asset and the largest foreign exchange earner in the country, as well as the largest single contributor to the Government's budget. Furthermore, the Project is providing numerous opportunities, both directly and indirectly, to appreciably enhance livelihoods in the various Project areas and in the wider region.

2.4 ENVIRONMENTAL AND SOCIAL SAFEGUARDS

A robust environmental and social impacts safeguards programme has been designed in conjunction with World Bank, Asian Development Bank and Agence Française de Développement. These measures are being fully funded as part of the Project's budget. It includes the entire Project area, and in particular:

- **The catchment area:** With respect to environmental protection and biodiversity conservation, the Nam Theun 2 reservoir will act as a natural barrier for the pristine forest of the Nakai-Nam Theun National Protected Area (NPA), which is in itself very valuable to the Project for being its watershed, ensuring continuous supply of water to the Project in the long run. This world-class primary forest area is recognized to be of outstanding significance in terms of its biodiversity. By receiving significant funding from NTPC to perform conservation activities in the NPA during the entire life of the Concession Agreement, the Government has committed to protect these 4,000 km² of forest and wildlife habitats in the long run. Accordingly, NTPC will directly contribute to the protection of the biodiversity in the Project watershed and in some surrounding non-watershed corridors.
- **The resettlement area on the Nakai Plateau:** The Nakai Plateau, through which the Nam Theun River flows, is composed of agricultural land, degraded forest, and both permanent and seasonal wetlands. The construction of the Project will require the resettlement of approximately 1,000 families or 6,200 people. The resettlement of these villagers onto the shore of the new reservoir will represent a considerable improvement in their livelihoods, and Nakai Plateau villagers have been hoping for relocation and better life to be created thanks to the Project since the beginning of its development. It is beyond the current financial capacity of the Government to help improving these population's livelihoods without the funding assistance and expertise from the Project. NTPC is legally committed with the Government through a very detailed Concession Agreement that was prepared in accordance with the Government policy on poverty reduction and ethnic minorities' development, and with World Bank and ADB Policies. Work on a pilot resettlement village, including the construction of 31 houses, an irrigation dam and distribution system, and electricity supply, began in early 2002. The families of the pilot village are now enjoying a new livelihood based on organized land ownership, permanent farms and community-based commercial activities. The model has proved to be a success and relatives from other villages on the Plateau are already joining to help for the work in the pilot village fields. By 2008, the entire 6,200 villagers will be re-established in similar locally designed villages provided with electricity, water supply, schools, clinics and other community infrastructures. Each village will have an irrigation

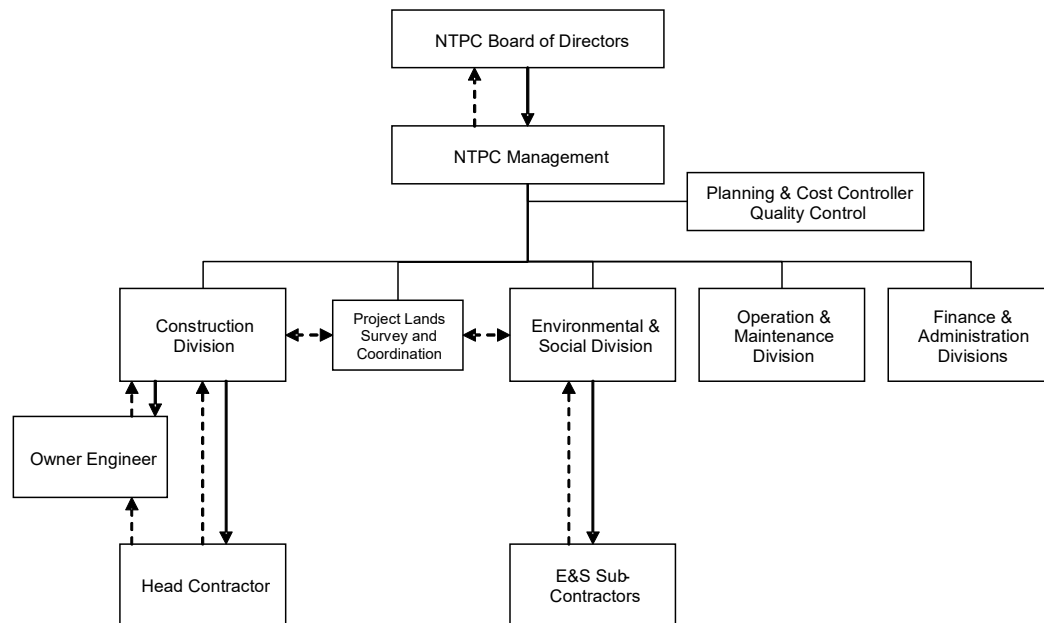
system, and villagers will be fully supported in their choice of a range of livelihood options including both irrigated and rainfed agriculture, commercial forestry, reservoir fisheries, livestock husbandry, and off farm activities.

- **The downstream areas and Xe Bangfai plain:** The essential Project environmental and social safeguards also include the careful preparation of a mitigation plan and associated budget to address the effect of the Project on the downstream areas and in particular the Xe Bangfai River, which will receive turbinated water after being regulated and released through a regulating pond and 27 km downstream channel. The Xe Bangfai will observe a progressive modification of its geomorphology and ecosystems due to increased flows of water transferred from the reservoir. In order to mitigate the effect of such river modification on livelihoods while enhancing the positive impact of bringing extra waters to this area, NTPC and the Government have agreed to jointly implement a US\$ 16 million programme funded by NTPC. This programme is aimed at properly compensating the villagers who live along the relevant sections of the Xe Bangfai, and whose livelihood depends partially on the Xe Bangfai River and tributaries. Loss of riverbank gardens and assets and impact on fisheries will be compensated through this programme. While allowing all year long navigation on the Xe Bangfai River, the extra water brought to the downstream areas below the power station will be used by impacted families for growing more rice and other crops during dry season. To that end, the Project includes the design of access points for irrigation facilities to be connected to the downstream channel so that communities be able to use the water for irrigation. Finally, the wider rehabilitation of flooding gates and expansion of irrigation system in the Khammouane province is envisaged in cooperation with other donors.

2.5 IMPLEMENTATION AND MONITORING ARRANGEMENTS

In order to fulfil its duties and responsibilities vis-à-vis its host and partner the Government of the Lao PDR, its shareholders, lenders and ultimate customers, NTPC is organized as follows:

- **The Construction Division** works with the Owner's Engineer (an external engineering firm hired by NTPC) to supervise and monitor the construction activities of the Project, which are performed by the Head Construction Contractor.
- **The Environmental & Social (E&S) Division** covers activities related to environment and social programmes. The E&S Division works closely with the Government units in charge, jointly with NTPC, of environmental monitoring and resettlement / social development activities in the Project affected areas. The E&S Division is also in charge of monitoring and advising the Watershed Management Protection Authority.
- **The "project land study and coordination team"** has been set-up to ensure a timely coordination between construction and E&S divisions with regard to project land activities.
- **The Finance and Administration Division** is in charge of all administration, personnel and finance matters and plays an important support role for the operational divisions in relation to contracts and procedures, document management, financial aspects, IT etc.....
- **The Operation and Maintenance Division** will be staffed progressively three years before project commissioning and will be in charge to operate the Nam Theun 2 hydroelectric facility and perform the maintenance of all assets.

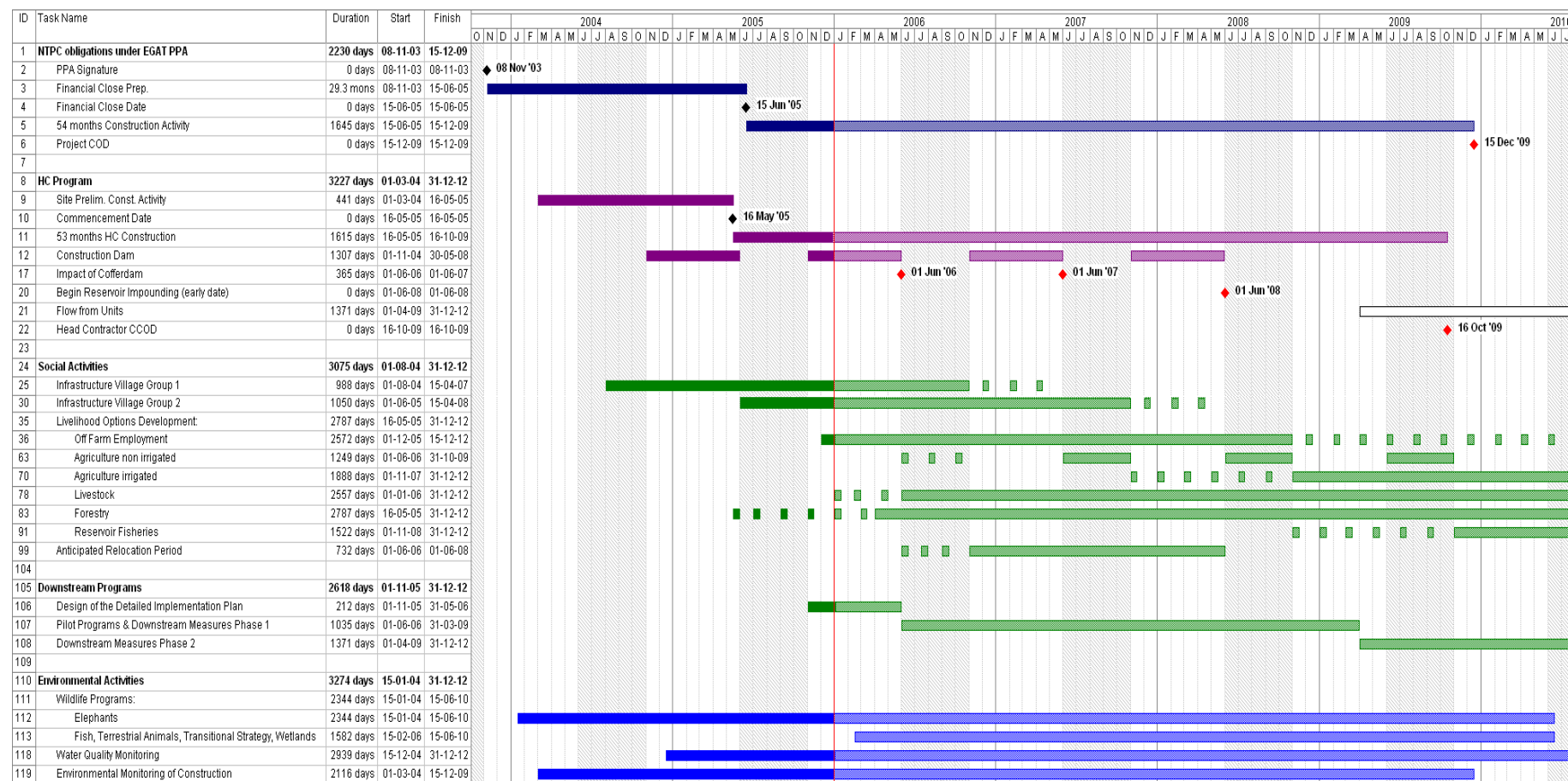


Being the owner company, NTPC is performing an internal monitoring of the Project construction, which is undertaken by a Head Contractor (namely EDF) and its civil work and electromechanical sub-contractors. That includes the monitoring of the environmental management during construction. For the implementation of the resettlement and social development measures however, NTPC and GOL are the direct implementers.

Also, in order to ensure that the Project is developed and operated in accordance with obligations as described in the Concession Agreement and Financial Documents, a comprehensive external monitoring structure has been defined. It is composed of internationally recognized and fully independent panels.

Panel	Acronym	Reporting to:	Monitoring frequency	Mission
Lender's Engineer	LE (team)	Lender's group (IFIs + Commercial Lenders + Export Credit Agencies, through the Inter-Creditor Agent)	Quarterly	Monitor quality, budget, implementation schedule and obligation compliance of : <ul style="list-style-type: none"> - Construction of project - Environmental protection related to construction activities - Social programmes (resettlement, downstream programme, project lands compensations, health) - Environmental programmes Depending on their findings, the LE issues warnings to NTPC in the form of Non-Compliance levels, which shall be properly and timely addressed to avoid financing drawstops.
International Advisory Group	IAG	World Bank	Occasionally	IAG is responsible for advising the World Bank in its handling of the social and environmental issues on the Project.
GOL Engineer	GOL-E (team)	Government of Lao PDR	3 to 4 visits per year	Advise GOL on NTPC compliance regarding all contractual obligations set in the CA (administrative, Lao preference, construction, Environment and Social)
Dam Safety Review Panel	DSRP (3 experts)	Government of Lao PDR and World Bank	Once a year or more if required	Monitor the compliance with the World Bank's Dam Safety Policy
Social and Environmental Panel of Experts	POE (3 experts)	Government of Lao PDR	Once a year or more if required	To facilitate guidance to GOL and NTPC on <ul style="list-style-type: none"> i) mitigation against and remedying of Project Impacts; ii) implementation of NTPC & GOL obligations under the Environmental and Social Objectives; iii) improvement and remedying of Unanticipated Project Impacts; and iv) the appropriateness and relevance of the Environmental and Social Objectives. The POE will act as the "ultimate judge" in case of a disagreement between the parties.
Independent Monitoring Agencies	IMA (team)	Government of Lao PDR	Quarterly for social aspects Annually for environment	To collect independent information and monitor implementation and effectiveness of environment and social programmes (including villagers' revenue post resettlement).

2.6 PROJECT OVERALL PLANNING



3 CONSTRUCTION Progress

3.1 CIVIL WORKS CONSTRUCTION ACTIVITY

3.1.1 Project Workforce

By the end of the period, almost 4,000 workers were employed for the construction activities, of which approximately 80% were Lao (with half coming from the Khammouane province). More than 2,000 workers were residing in one of the six Construction Camps, based in the vicinity of the main construction sites. The Contractor's Main Camp, located near Gnommalat, is by far the largest camp, with more than 1,200 workers. 400 to 600 workers will eventually be stationed at the permanent Dam Site camp, while camp followers will be located near Lak Sao to limit as much as possible the impacts on the nearby protected forest.

3.1.2 UXO Clearance

Portion of the land used in the construction and resettlement aspects of the Project are contaminated to varying degrees with Unexploded Ordnances or UXO. For the safety of infrastructures, workers and resettlers, NTPC and Head Contractor undertook a vast UXO clearance programme since the beginning of preliminary construction activities in 2004. The programme covers not only the Project infrastructure areas, but also the resettlement areas and related agricultural zones, access roads (including the main road between Thakhek and Nakai), and various residential areas. In addition to the actual clearing work, NTPC has developed a safety policy, which fully integrates the risk associated with UXO in the Nam Theun 2 Project area. The NTPC UXO safety policy requires:

- the provision of basic advice regarding required work practices for employees and contractors in relation to the presence of UXO
- the provision of procedures for UXO discoveries made by employees or contractors
- the development of UXO awareness among the local population

By October 2005, almost 10,000 UXOs, ranging from small BLUs to 400 kg bombs had been collected and neutralized in the vicinity of construction areas, representing an area of 1,700 ha cleared. In total, almost 3 million units had been detected, mainly bomb fragments or metal scraps, all of them requiring check by a de-mining technician.

3.1.3 Roads

The Project will construct a number of infrastructures, including 145 km of new and upgraded roads and bridges in the Khammouane province.

During the period, there was damage caused to the roads as a consequence of the heavy rains this rainy season. However, substantial maintenance and temporary roadworks and bridge were maintained throughout the Project area.

Design works for new roads continued throughout the period. Survey and UXO clearance activities have continued while maintenance and refurbishment activities have been performed along the road between Thakhek and Nakai. Mobilization for the permanent roadworks accelerated. Work continued on reconstruction of Road 12 between Thakhek and the Road 12/8B junction, and work commenced on the new permanent access road from Ban Phon Sa Ard to the Dam Site.



Road Works – Road 12 at Km 13

3.1.4 Nakai Dam

The diversion tunnel outlet and inlet portal have been excavated. The inlet portal was successfully dewatered at the end of September following the flooding events that have occurred during the first three months of the period. Because of these floods, the tunneling work was initially behind schedule, but through active engagement of the tunneling contractor, the work progress was brought back on schedule. Resumption of excavation of the remaining rock plug within the diversion tunnel could commence after the inlet portal rock excavation was completed and the outlet portal area dewatered.

In line with the planning, no dam excavation has occurred during the period.



Nakai Dam – Left Abutment – Diversion Tunnel Inlet & Outlet



Nakai Dam – Temporary Footbridge

3.1.5 Power Conduit Water Intake and Power Conduit

(a) Intake and Adjacent Headrace Channel

Intake tunnel excavation was completed at the end of August 2005.

During September 2005 some temporary backfill was placed for platforms for equipment and access for the Headrace Tunnel excavation, which will allow commencement of the Headrace Tunnel portal in October 2005.

At the end of September 2005, the final excavation elevation has been achieved along the entire length of this portion of the Headrace Channel. Rock protection placement on the banks of the Headrace Channel adjacent to the Intake was also completed in September.

The excavation of the Headrace tunnel heading commenced at the Intake Portal early October.

The work continued to be carried out in 2x10 hour shifts.



Power Conduit Intake – Approach Cut to Intake Portal



Power Conduit Intake – Headrace Excavation facing Intake



Power Conduit Intake Excavation

(b) Headrace Tunnel and Surge Shaft

Platforms and Portal

Preliminary works for the spoil disposal platform have started.

Access Adit

Excavation face of the Headrace Tunnel Access Adit was completed in September 2005. Excavation of the Access Adit was on programme.



Access Adit

Surge Shaft Access Road and Surge Shaft Platform

Work on construction of the Surge Shaft access road is ongoing from both ends.

(c) Pressure Tunnel

The Pressure Tunnel excavation reached Station 694 m at the end of October 2005, out of 874m. The high pressure water test will be conducted by end 2005.

(d) Access and Drainage Tunnel

The Drainage Tunnel excavation reached Station 498 m at the end of October 2005, out of 895m.



Drainage Tunnel – Plate Jacking Test

3.1.6 Power Station, Substations and Tailrace**(a) Power Station and Tailrace Channel Excavation**

Final blasting for the Power Station excavation occurred at the end of September. All excavation activities were completed by the end of the reporting period.

Work commenced on the installation of the earthing network, including related continuity and resistivity testing.

Full concreting works were initiated.



Power Station – Excavation, Manifold Tunnels



Power Station – Earthing Grid Installation

(b) **Nam Kathang Diversion**

Prior the actual channeling of the Nam Kathang (scheduled to occur during the dry season), a consolidation of the bank have been done and a coffer dam established to protect the construction of the power station area from flooding's.

(c) **Switchyard**

As at the end of September 2005, a total of 39,000 m3 of backfill has been placed, out of a total of 465,000 m3 needed for the platform to be raised to its final elevation.



Power Station area – Switchyard area at the back, Nam Kathang on the left

3.1.7 Regulating Dam and Regulating Pond

No activity yet during the period

3.1.8 Downstream Channel

(a) **Upstream Section**

Mobilization commenced for temporary Nam Kathang diversion works and for the upper part of the Downstream Channel and the related spoil disposal area.

(b) **Middle Section**

No work was undertaken during the reporting period.

(c) **Downstream Section**

Vegetation and UXO clearance of the full width of the alignment has been ongoing with temporary stops during the flooding's that have occurred during July until September.

3.1.9 500 kV and 115 kV Transmission Lines

UXO shallow search continued for the 500 kV transmission line corridor. Approximately 40 % of the total line length has been cleared. Several UXO items were discovered and destroyed.

Line profile survey work commenced and is being progressively checked by the Head Contractor.

3.2 ENVIRONMENTAL MEASURES LINKED TO CONSTRUCTION

Construction activities are requested to be carried out within the framework of a set of Environmental and Social measures. 18 topics are covered by the Environment Monitoring and Management Plans (EMMP), such as erosion protection, dust, noise, waste management, etc. (ref. EAMP)

These EMMPs are implemented by the HC Health and Safety Team, through Site Specific Environmental Plans (SSEP), which have to be reviewed and approved by NTPC prior to implementation.

During the period, NTPC has developed and began to implement a procedure to monitor the performance and compliance by the HCC and subcontractors related to EMMP and SSEP as follows:

- NTPC receives and reviews monthly reports by the HCC.
- In parallel, NTPC has recruited a team of two environmental inspectors based at site. Environmental inspectors prepare daily reports on the situation at the various construction sites (including dam, power station, water intake, etc.) and identify potential issues against the non-compliance scale that has been defined in the EMMPs.
- On the basis of these daily site reports, NTPC sends a weekly summary of issues to the HCC and, if necessary, asks that corrections be implemented.

During the period, NTPC received and reviewed more than 65 SSEPs from the Head Contractor. Environmental protections in relation to construction activities are being implemented (including drainage channels, sediment ponds, bins for waste collection, fuel storage facilities, etc.) Re-vegetation works are being carried out on sensitive slopes. Several training sessions have been performed and various warning boards concerning wildlife protection have been provided in workers camps.

Environmental protection measures during construction – Poster 1:

Environmental Protection Measures



Petrol and Waste Oil Storage Area (Platform 1)

Hazardous Materials

Storage of HazMat

HazMat shall be stored in a storage area protected by bunding. The volume of the bund is in excess of 110% of the volume of the largest container.

HazMat Storage/Use areas shall have storm water treatment before discharge.

Acids, coagulants and flocculants will be stored in a separate container with a bund to contain spills.

Shotcrete accelerators, chemical resins and cement grouts will be protected from the weather. The storage location will be within a safe area, as such any spill would be contained and out of flooding occurrence.

Waste oil and other liquid HazMat waste will be collected by a liquid waste removal tanker and will be disposed of at a safe temporary disposal area for Hazardous Waste.

(EMPP – SP05.3)



Main Petrol Storage Area (Dam Site)



Bins for Different Types of Waste with Labels (Access Adit)

Bins for Different Types of Waste with Labels
(Construction Camp, Platform 1)

Waste Management

Bins for Different Wastes shall be provided at any Construction sites (EMPP – SP12)

A. Non-Hazardous Waste

GROUP A1: Combustible Solid Waste
Cardboard
Plastics
Clean paper
Food waste
GROUP A2: Non-combustible, Non-Hazardous Waste
Metal
Glass
Machinery parts
Rubber waste
Tires
Concrete
Other construction debris
GROUP A3: Non-Combustible, Potentially Hazardous Waste
Refrigerator units to be burnt (e.g. 9 ton unit)
Other hazardous waste from various tanks

B. Hazardous Waste

GROUP B1: Hazardous Waste
Acids and alkalis
Batteries
Chemicals and waste
Flammable and flammable containers
Fuel drums, oil drums and steel oil
Fuel oil and oil-based waste
Fumes
Hydrochloric acid
Insulation material
Paint and paint waste
Pesticides
Solvents
Spill clean-up waste
Waste from grain traps
Other waste when its composition is unknown

Note: When any waste is in this column (A2) it is to be labelled HAZARDOUS and its name, source and components

Sediment Control

Design specifications for erosion and sediment control measures:

- All erosion and sediment controls will be designed to cater for a minimum of a 2 year ARI flood event.
- Runoff velocities will be reduced by minimising flow lengths.
- Retention of vegetation along watercourses reduce flow velocities.
- 'Clean' runoff from undisturbed areas will be diverted away from the construction site.
- Runoff from disturbed areas will be directed into sediment trapping or filtering devices.
- Silt fences or vegetative fences should be installed to intercept any sediment.
- Sediment trapping or filtering devices such as sediment fences, sediment basins or traps will be constructed to capture and treat sediment laden runoff from all disturbed areas.
- Sediment collection devices will be cleared when basin capacity is reduced by a maximum of 50%.
- Sediment collection devices will be used to treat runoff from the site as appropriate.
- Release of discharge will only occur after monitoring to meet the requirements of Water Quality Monitoring.
- All discharge from sediment collection devices will pass through a vegetative or silt filter, prior to release to an established watercourse.
- Trash racks will be provided at the outlet of all main drainage points entering watercourses. Trash racks will be cleared daily and waste disposed off.
- All erosion and sediment controls will be inspected once a week during the dry season and every 24 hours during the wet season.
- Prior to the wet season, a review of the effectiveness of the erosion and sediment controls will be made.
- Wastewater generated during tunnelling will be collected in a sediment basin prior to discharge (EMPP – SP1.32).



Waste Water Sediment Basin (Concrete Batching Plant 1, Platform 1)



Sediment Basin (Concrete Batching Plant 1, Platform 1)



Water Tunneling Sediment Basin (Access Adit)



Waste concrete basin (Concrete Batching Plant 1, Platform 1)



Nam Theun 2 Power Co., Ltd
Environmental Management Office (EMO)

Environmental protection measures during construction – Poster 2:

Environmental Protection Measures

Drainage System



Drainage at Contour line of the Site (Intake and Headrace Channel)



Drainage at the Downslope of the Stockpile Embankment (Powerhouse)



Runoff Drainage Protection (Switchyard)



Drainage above the Slope (Concrete Batching Plant L, Platform 1)

Embankment Protection

Measures to minimise erosion:

- ◆ The location of works in sensitive erosion areas will be minimised.
- ◆ Where possible, works in sensitive erosion areas will be restricted to the dry season.
- ◆ "Sensitive erosion areas", are defined as follows:
 - Areas with slopes > 20%
 - Areas within 50m of a bank of a natural watercourse
 - Cut and fill slopes in areas of slope instability or erodible geology
- ◆ Progressive revegetation of exposed areas will take place as soon as practical following completion of construction works in that area. Reference will be made to Sub-Plan No. 10 in relation to suitable species for revegetation works.
- ◆ If construction works are temporarily stopped in an exposed area (for longer than 14 days), temporary stabilisation of exposed surfaces will be undertaken.
- ◆ Rip-rap, or similar, will be installed at the inlet and outlet of all culverts to prevent scour erosion.



Culvert Head Protection (Road 8b)



Revegetation of Embankment (Residence Nam Theun)



River Bank Protection along Nam Kathang Rd (Powerhouse)



River Bank Protection along Nam Kathang Rd (Switchyard)



Nam Theun 2 Power Co., Ltd
Environmental Management Office (EMO)

3.3 PLANT MANUFACTURING, TESTING AND ERECTION ACTIVITY

Not yet applicable. Presently at design stage.

3.4 TESTING, COMMISSIONING AND TAKING OVER

Not yet applicable.

4 RESETTLEMENT AND SOCIAL DEVELOPMENT ACTIVITIES

As defined in the Concession Agreement, the Project has been in the planning phase during the period.

4.1 STAFFING AND PARTNERSHIPS

4.1.1 Developing NTPC Capacity

As end of October 2005 NTPC E&S Division was composed of 59 people (47 Laotians / 12 foreigners). It represents 88 % of maximum required staff (67 people). 100 % of the management is in place. NTPC also uses consultants, including a social scientist focusing on Resettlement Action Plans for Project Lands, and several compensation officers. The social scientist was recruited in line with POE recommendations. A livelihood planner remains to be recruited and several interviews were conducted.

NTPC teams are working in coordination with GOL teams: Resettlement Committee, Resettlement management Unit and District Working Groups. Most of the E&S teams are located at site, in Nakai, Gnommalat and Thakhek.

4.1.2 Partners

NTPC is willing to use experienced organizations for the implementation of the resettlement and social development programme related to the Project. Accordingly, it has developed a number of relationship with development NGOs and Research Institutes as follows:

Implication in the project	NGO, Research Institute
Elephant Programme Since March 2004	Wildlife Conservation Society (WCS)
Public Health Action Plan: Analysis of Baseline Health Data September 2004 – March 2005	Institut Francophone pour la Médecine Tropicale (IFMT)
Morpho-pedological and agronomic appraisal in Nakai Under AFD Grant - June 2005	Centre de Coopération Internationale en Recherche Agronomique pour le Développement (CIRAD)
Livelihood assessment and compensation. Under advanced discussion	INGO

Discussions are also underway with other NGOs, Institutes and International Agencies to have these organizations serve as advisors or consultants to the GOL and/or NTPC on issues such as Anti Human trafficking awareness, Road Safety, and Agriculture / Livestock Programme.

4.2 PHYSICAL CULTURAL RESOURCES (PCR), PROJECT LANDS, CAMP FOLLOWERS

4.2.1 Physical and Cultural Surveys & Salvage

(a) Background

The baseline PCR survey undertaken in 2004 identified all items and sites of PCR significance that are located either within or adjacent to Land Parcel Areas. The survey also provided an impact assessment for each PCR site.

The Head Contractor was notified of all PCR sites that were located both within and adjacent to Land Parcel Area (LPA) and was requested to provide impact assessment advice for those PCR located within LPA.

Based on the findings of the baseline survey and the impact assessment advice provided by the HC, the PCR items and sites were separated into four PCR plans for (i) movable PCR; (ii) PCR within construction areas; (iii) PCR within the Reservoir; and (iv) PCR along the Xe Bangfai.

To date, the Institute of Cultural Research (ICR) has implemented the PCR plan for (i) movable PCR and (ii) PCR within construction areas. Implementation consisted of a series of consultations with PCR custodians. Potential impacts were discussed with the custodians then mitigation and compensation measures, that would help prevent any adverse impact, were identified and implemented.

In addition to those PCR that were identified during the baseline survey there is a potential for additional sites or items of PCR to be identified during construction activities. These sites or items are termed "chance find PCR" and a procedure has been developed, in conjunction with Department of Museums and Archaeology, to deal with these PCR as and when they are discovered.

(b) Main activities during the period

During the period, the Institute of Cultural Research and the District Ministry of Information and Culture implemented compensation measures for two PCR sites that will be impacted by construction activities along the new alignment of the 500 kV transmission line. The compensation measures, requested by the custodians during consultations that were undertaken by the ICR, consisted of:

- An appeasement ceremony for a spirit site; and
- Fencing with a lockable gate to help secure movable PCR items at a cave.

In the framework of the documentation of the historic significance of Road 8b, the Department of Museums and Archaeology (DMA) conducted consultations in various villages on the Nakai Plateau, the Gnommalat Plain and around Laksao. Because of its role in the second Indo-China War, Road 8b was identified as a site of historic significance. To compensate for inundating a portion of this road, NTPC has commissioned the DMA to further document the road's historic significance. This documentation will consist of both literature review and personnel accounts of the history of the Road.

Appeasement ceremony for a PCR spirit site.



More generally, mitigation and compensation measures supported by NTPC for PCR impact include:

- (i) appeasement ceremonies for impacts to cemeteries and spirit sites;
- (ii) ceremonies and logistic support for relocating movable PCR within caves to the security of the temple;
- (iii) provision of security measures (fencing or huts) to protect PCR that the custodians requested to remain within cave or on open ground;
- (iv) improving security at temples to protect movable PCR from theft; and
- (v) undertaking consultation to raise awareness of the potential impact of theft during the construction phase.



Security fencing constructed as a mitigation measure to help prevent any impact of theft of Buddha images located in a cave.

Several Chance Find PCR were identified during the reporting period and were dealt with by the Ministry of Information and Culture (DMA and IoCR).

4.2.2 Project Lands

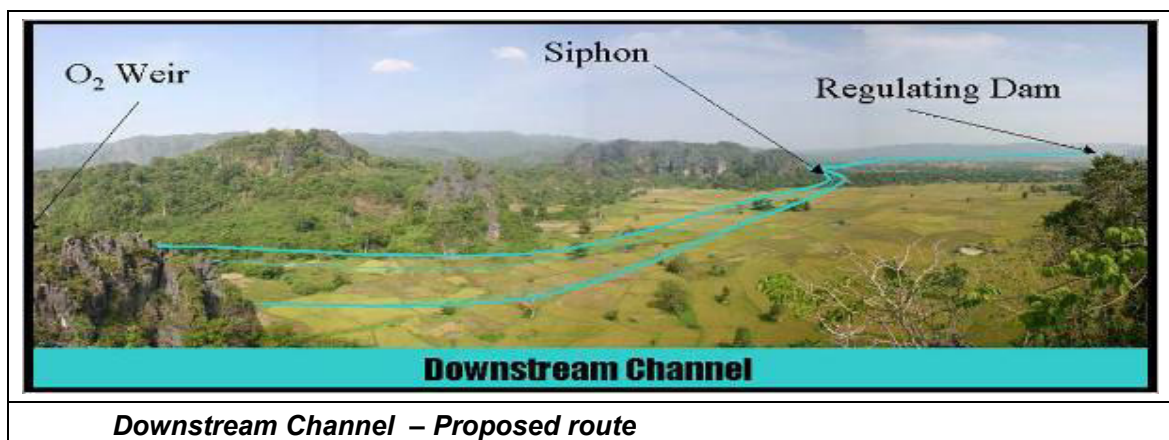
(a) Affected areas

In total 3,700 ha and approximately 6,000 people will be impacted at various degrees by the construction works. Also, NTPC has been working with the Head Construction Contractor to ascertain precisely which areas are required for construction and at what time, in order to implement compensation activities in accordance with the construction schedule, so as to avoid unnecessary or untimely disturbance to impacted communities.

- **Project Roads:** While road improvement works are not expected to impact significantly on villages, NTPC is working with District Working Groups (DWGs) to complete households and assets registration along the road alignment so that any impacts that may arise may be assessed and properly compensated. Accordingly, baseline study type data (land and asset registration) continues to be collected by DWG personnel under the guidance of NTPC along Road 8b and Road 12, from Thakhek to the Regulating Dam. Such registration activities were concluded by the end of the period.

Following a Road Safety Workshop that was held in Thakhek in August, Project Land personnel collaborated with GOL officials from various agencies to determine proposed locations for bus stops along Road 12 and Road 8b. This information has been conveyed to the constructor for incorporation into the Detailed Design of the overall Project roads scheme.

- **Regulating Dam and Downstream Channel:** In order to better define the most appropriate resettlement location for the approximately 15 household that need to be relocated for the first stage of works initiated for the construction of the regulating dam and most upper section of the downstream channel, NTPC has been working with the Department of Irrigation (Dol) of the Ministry of Agriculture and Forestry for the development by GOL of irrigation systems using water from the downstream channel. The Dol has now commenced its study of the area. Their preliminary findings have been discussed with NTPC, and NTPC has provided the Dol with additional information on the operational aspects of the Regulating Dam and Downstream Channel.



Besides, the construction contractor is timing the commencement of their construction activities so as not to impact the harvesting of wet season crops. Therefore, the impact of Project activities on livelihoods during the period has been minor.

In parallel, NTPC has been discussing with various rural development NGOs regarding the design and implementation of livelihood programmes related to such Project lands. NGO's input will be to focus on the design of tailored compensation schemes through consultations with identified PAPs for livelihood restoration options, and later to manage the implementation of the compensation programme using information derived from baseline studies. Discussions have been conducted with the NGO, including field visits undertaken to scope the work. By mid-December, the NGO confirmed its agreement to participate in the Project and its mobilization for phase 1 is anticipated in January.

- ***Oudomsouk Urban planning:*** The saddle dam 12B, for which the construction area is scheduled for handover to the contractor in stages as from mid-December. It will require the resettlement of 54 households in Oudomsouk. Accordingly, the development of a new urban area including access roads, water and electricity supply and timber houses has been started. The impacted primary school is also being relocated. A Resettlement Action Plan has been drafted and consultations undertaken with respect to the resettlement of villagers away from the construction area.

***Overview of
Oudomsouk –
new urban Area
on the left***



(b) Training of Government staffs and consultations

During the period, workshops and capacity building sessions were held with District Working Group (DWGs) and Resettlement Management Unit (RMU) personnel from various districts on Project Land activities, in particular with respect to asset registration, evaluation and compensation.

NTPC's Project Land team has been reinforced to optimize the existing grievance process and to ensure that all Project Affected People (PAPs) are aware of the procedures available to them to resolve potential concerns. Accordingly, posters and flyers have been designed and printed for distribution

to all Project Affected Villages (PAVs) throughout the Project areas. Grievance books, posters, and writing tools have been distributed to villages' chiefs and village grievance committees of Gnommalat in advance of the actual beginning of construction activities in this area. Flyers were also distributed in Khamkeut District of Bolikhamxay Province in the vicinity of Phou Pha Phen Quarry, and along the alignment of the Dam Site access road.

(c) Note on the interim compensation

While finalizing tailored made compensation packages for each villager having part or all of its house, or its livelihood impacted by construction activities, NTPC has been implementing interim compensation to the most immediately impacted villagers. Such compensation mostly took the form of cash compensation. Excluding villagers impacted to less than 10% of their current property and livelihood (such villagers receive an immediate and final cash payment), interim compensation is obviously not complete and villagers who received such advances will later be more comprehensively compensated for the loss they have incurred.

4.2.3 Camp Followers

Due to GOL/NTPC collaboration, the situation of "camp followers" remains good and there was no occurrence of potential negative effects from the camp follower phenomena. Estimates for new comers in the area are being developed. In parallel to keeping updated information about the localization and activities of camp followers outlets, NTPC is working on the improvement of food hygiene and STI control. Health service provision to "camp followers" in the project area is available from the district health services. NTPC and GOL are aware that the presence of camp followers may lead to two main health concerns. These are:

- As many new eating places have appeared in the area, hygiene in these make shift eating places are likely to be poor in nature leading to increase in food borne diseases.
- Bars and other entertainment venues may encourage alcohol abuse, disorderliness and prostitution leading to increase in injuries and sexually transmitted infections.

The district health office is aware of these potential impacts and with the support of the NTPC's HPMU, is engaged in the following measures:

(a) Food Hygiene

The following measures have been implemented to keep a check on the minimum standards to be maintained in all the eating places. Following points detail the plans:

- All eating places are required to be registered with the local government, either with the district health office or the local government offices. Hence each eating place has to display a registration certificate in the restaurant.
- Regular visits are made by health officers to check the hygiene standards of the restaurants.
- Information is being collected to establish restaurants are run by the local people or people are coming from outside. Information will be regularly updated to monitor the increase in the local population.
- Water supply to these establishments is through the shallow wells. The water in wells is not likely to be fit for washing purposes and requires

testing and regular treatment. Methods to deal with this problem are being explored.

- Washing of hands in eating places is presently unhygienic with a common basin for all to wash hand in. A receptacle with a tap is being organized in each restaurant so that washing of hands before eating becomes meaningful and effective.
- The progress of the programme is reported regularly in monthly reports.

(b) STI and its control

Measures required to monitor and control STIs are as follows:

- All bars are registered under local government rules.
- The number of service women working in these bars are also monitored by District Committee for Control of AIDS (DCCA)
- Regular health awareness and education programmes are organized for the service women and general public, promoting protection against STIs by using condoms.
- Education programmes for workers are also organized by HCC under Project Staff Health Plan.
- Opportunities like boat race festivals and other public events are being used to make increase public awareness of the STIs and how it can be prevented.

(c) Alcohol abuse and other drugs

Alcohol abuse and use of other drugs are part of HIV/AIDS education programme. PCCA/DCCA incorporates this aspect of education in the general programme of awareness and education in districts and the province. In addition, education relating to safe drinking will also be organized for public and high risk groups under the road safety programme.

More generally, tasks undertaken during the period also included:

- *Traffic safety and regulations:* Development of regulations and safety programmes for schools
- *Human Trafficking Control:* Monitoring of labor and Population movement, NGO training on trafficking prevention programmes, Information campaigns in vulnerable areas, establish and support anti-trafficking network in villages; preparation of an action plan with UNICEF, PADETC and some other NGOs.
- *Social Security and capacity building for local agencies:* Support and technical assistance for district Police Offices, support for department of roads, review and strengthening of regulations, establish intersectoral task force on population management and security. Support is also provided to promote the organization of District Grievance Committee (DGC), the organization of Village Grievance Committee (VGC) and improvement of village regulation in 7 villages nearest to the construction camps.

NTPC and GOL will continue to monitor carefully the situation so that to keep it under control all along the Project implementation.

4.3 PUBLIC HEALTH REGIONAL AND RESETTLEMENT PROGRAMMES

Routine monthly meetings have been conducted in the districts and the province. The meetings provided an opportunity to discuss and explain the conceptual basis of the Public Health Action Plan, mutual exchange of experiences and difficulties in implementation of the programme, discussions on the forthcoming activities and reporting of the past activities.

4.3.1 Construction and rehabilitation of health Infrastructure

The Public Health programme includes:

- The construction and 4 new health Centers and 1 District Hospital.
- The rehabilitation of 2 existing Health Centers, 3 District Hospitals and Emergency Department of Thakhek.

The Bill of quantities, drawings have been written, and the Bidding documentation is nearly finished.

4.3.2 Medical and non-medical equipment

Medical and laboratory equipment (for health centers and hospitals of project area):

The International Bidding process is ongoing according to the WB procurement rules.

STIs (including HIV/AIDS Programme):

The Provincial and District Committees for Control of AIDS (PCCA & DCCA) are being supported by HPMU to provide STIs services. HIV+ patients if/when identified in the resettlement programme will receive free treatment according to the CA. Voluntary testing and counseling is available to anyone in the province who may require the service, from the provincial hospital.

Several health education and awareness activities supported by HPMU were organized by district health and DCCA/PCCA during boat racing festival in September and October. Awareness campaigns regarding sexually transmitted infections, including HIV/AIDS, was conducted in Mahaxai, Nakai, Gnommalat and Khamkheut districts during the boat racing festival. Another major STI and HIV/AIDS awareness campaign was conducted in the provincial headquarter, Thakhek.

Vehicles:

Four 4-wheel drive vehicles and tree ambulances have been procured through IAPSO in July 2005, and will be given to District health offices. 12 motorbikes have been procured and distributed. Six motor bikes were distributed to each one of the six health centers in the Project, and another six were handed over to the district health officers in November.

4.3.3 Awareness programme

Supplies, drugs, kits, forms and manuals:

Drugs under the Drug Revolving Fund (DRF) have been distributed to all centers and the provincial hospital.

Kits for VHVs are being procured for distribution during the training programme early next year.

Where ever possible routine MOH forms are used and maintained. New forms for collecting important information will be developed and used where ever required.

HPMU promotes the use of all the existing MOH recommended manuals for health workers. Where in short supply, PHMU will print and distribute. District Hospital Treatment manual produced by IFMT has already been distributed to all district Hospitals. Discussions are in progress with Provincial and District health Officers to consider the distribution of this manual to the health centers if appropriate.

Vaccines for EPI programmes in Districts: on-going through MOH and UNICEF Programmes.

Anti TBC Drugs, family Planning consumables, Vitamin A, folic acid and ferrous sulphate for antenatal programmes are all covered under MOH programmes and distributed with assistance from other agencies. HPMU will assist if there are any difficulties in obtaining any one of these in the programme.

Relocation of medicinal plants:

Medicinal Plants Survey and traditional practices in the Nakai Plateau was conducted during the 2004-2005 dry season to gain understanding and knowledge of traditional practices and collect the names and pictures of medicinal plants used in the area.

Two field surveys were conducted during the 2004-05 by an anthropologist and two experts from the Traditional Medicine Research Centre. Final report submitted in July 2005 reported that there is no loss of medicinal plants expected by the lake formation in Nakai Plateau. The study and understanding of the use of medicinal plants will be continued under the Resettlement Health Programme in the Nakai Plateau.

Road Safety:

A review in March 2005 of existing road conditions (12 & 8b) was carried out by an independent consultant. Recommendations and measures to reduce chances of accidents have been identified and were presented to the NTPC. The final report of the Road Safety was presented in a Workshop held in Thakhek on 19th August organized for the purpose. The Governor presided the meeting and over 60 people participated from a number of related provincial departments. The recommendations made during the meeting and from the consultant's report are being followed up by continued programme of Road Safety supported by NTPC. A multidisciplinary group, consisting of a number of government departments and NGOs will take this programme forward.

4.3.4 Strengthening human resources in Public Health

Nakai district health office has already identified and nominated health workers to work in the resettlement populations by staffing the ICHCs (Integrated Community Health Centers). A visit to an ICHC in December by district Health officer, representatives of the resettlement populations and HPMU has been planned. This will be followed by sending the identified staff for ICHCs for training programme by spending 4-6 weeks working in an ICHC.

A two month Emergency Medicine Training was organized for 9 health workers in April-May 2005 in Mahosot and Friendship Hospitals in Vientiane.

First meeting of Training of trainers in PHC/MCH was held from 22nd-26th August. This was followed by training of all Health Center staff in MCH.

VHVs training started in December. The training programme was conducted in each District for VHVs. The training programme for new VHVs will be conducted separately.

4.3.5 Public Health Monitoring and Surveillance

Routine data collection / HIS:

Data collection is being reviewed continuously during field visits and through monthly reports to the district health offices. Priority is given to strengthen the quality and quantity of the exiting data collection. Where required and appropriate, new dataset are identified and collected.

Outbreak Response Preparedness (Khammouane and Bolikhamxay Provinces): a consultant has been hired to work with the National Center for Laboratory and Epidemiology to develop the plan before the end of year 2005. A specific plan related to Avian Influenza was developed.

Scientific Support:

The Institut Francophone pour la Médecine Tropicale (IFMT) has agreed and signed a contract to provide a 2-year consultancy services for scientific support to the Health Programme Management Unit. Contract between IFMT and NTPC was signed in October.

Existing data Analysis 2004:

Analysis of available health data and proposal of baseline health indicators was completed by IFMT and the report sent to NTPC in May 2005. The document has been reviewed by the Public Health team. Findings provide additional information to the base line data. This is saved as repository for the future comparisons of new surveys.

Health Checks in resettlement villages:

Preparatory meetings for the pilot village health checks planned for December were conducted, manpower and other logistics organized and requisition for funding made. The health checks and general survey were conducted in December. This forms the basis of methodology to be used for all relocated villages in the next two years. A number of additional services, such as anemia diagnosis and treatment, parasitic infestation checks, treatment and monitoring the health of under-five and antenatal care to pregnant women were carried out during the surveys.

Note: Camp Follower Health issues are discussed in the Camp Follower section above.



Opening remarks of the 5-Day PHC/MCH Refresher Training Course by the PHO Deputy Chief.

Data collection during the 5-day practical training course – Data analysis and problem ranking was performed subsequently.



4.4 NAKAI PLATEAU RESETTLEMENT

4.4.1 Pre-resettlement Activities

Pre-resettlement activities are being undertaken, with a particular focus on the first group of villages (VG1) to be relocated second half of 2006. Compared to tentative plan expressed in the Social Development Plan and Project Implementation Plan, a delay has occurred as the VG1 villages were originally planned to be relocated from late 2005. In conjunction with the GOL and consultations with stakeholders, NTPC has decided to slightly modify the tentative plan so as to better prepare livelihood plans and allow the villagers for a more optimized and smoother resettlement.

Scheduled dates for completion of relocation of villages are currently November 2006 for VG1 and September 2007 for VG2. NTPC is currently developing the existing schedules to show livelihood and infrastructure development on a village by village basis. This will assist in determining the optimum relocation dates for each village.

Nevertheless, should the backwater effect resulting from the closing of the cofferdam in June 2006 trigger some flooding of the lower portion of the Sop Hia

and Nam Nian villages, NTPC intends to compensate for any potential flood-related damages. That may include the temporary relocation of some houses in some higher parts of the villages.

(a) Community consultations and development programme

Community consultations continued as weather condition permitted throughout the period. Further assessment of increased risk of flooding based on latest design from the Head Contractor are being considered carefully to ensure absolute minimum disruption to villages. Most were carried out in VG1 villages, and focused on development and confirmation of village layouts, including community buildings and other facilities. This stage of consultations is now complete for the three southern villages of VG1, and is on-going for the four northern villages as well as Sop Hia and Nam Nian.

Community consultations had to accommodate a review of the 2003 Census population figures. NTPC Consultation Teams, with assistance from RMU, have completed the update for all villages and an addition of more than 200 people has been recorded. Variations are mainly due to births, return of relatives, and also in some cases migration of people from areas external to the Nakai Plateau. Records are currently being updated with the reason for each additional person (not being included in the original census) documented. These additions will be considered by NTPC in consultation with the RMU and Districts; those which are clearly within the bounds specified in the Concession Agreement for inclusion in the Resettlement Programme will be recommended for inclusion in the programme; those considered ineligible will be considered on a case by case basis and will have recourse to further consideration through their village committees and also through the Grievance Committee.

An International Gender Specialist has been recruited, to direct and supervise the NTPC Gender Officer and steer the overall programme with respect to gender. The first of several periodic inputs has been scheduled for early December 2005

In order to implement an appropriate approach to community development for the agriculture and livestock sector (on farm community development), specific consultations have been conducted at Sop On, Bouama, Phonsavang, Keng Gnao and Sop Ma village for agriculture and livestock evaluation meetings with the villagers. Progress to date includes completion for VG1 of both of the Livelihood Development Steps outlined in NTRA-FLUPAM Steps and Procedures:

- Stage 1: Consultations to explain and review:
 - Range of livelihood options available
 - The risk and benefits of these options
 - The balance between options which the villagers would prefer
- Stage 2: Participatory review of livelihood options and activities

The next step is to reassess and refine these options in the light of resources mapping and utilization planning. Preliminary village resources mapping and utilization planning is currently being conducted for VG 1 and Nam Pan – these first estimates are expected to be complete by mid-December 2005. Further refinement will be made as part of the village boundary demarcation process – this process must take many complex factors into account and needs to be done in cooperation with the Districts, RMU and the Resettlers. Potential village livelihood activities will be further refined for specific villages as additional technical information is compiled.

The evaluation at Nongboua Pilot village is continuing in order to prepare detailed activities aimed at strengthening production groups. To date it has been necessary to focus on Pilot Village and Demonstration / Extension centers to a large extent in order to develop and test different livelihood options. These centers offer ideal venues for training and information dissemination. Over the last few months, the activities conducted at the Pilot Village and Demonstration farm have focused more on other villages – with approximately one third of all activities during October directed at non-pilot village people.

A workshop in early November evaluated the experience of the Pilot Village and Demonstration Farm in the context of potential replication and sustainability in other resettlers' villages. The findings of this workshop will be incorporated into livelihood development plans.

Non-farm community development activities included the establishment of village resettlement committees and development of their respective role in census and data management, the building of village resettlement office and consultation centers, consultations and training in various villages and groups, population management including final census and asset inventory in 6 villages, issuance of family registration books in 2 villages and the support to income generation activities. The establishment of village savings and loan facilities is also underway with credit funds already established in 7 villages. Rice banks have been established in 13 villages.

Education programme have been successfully initiated with the selection and training of teachers for non-formal education (mainly literacy and numeracy), the distribution of school materials, the establishment of parent association committees, and the provision of support food for children's lunches and teachers' and nursery workers' salaries at the Nong Boua nursery.

(b) Livelihood plans

Nakai Plateau Forestry development Programme: During the period, the forestry component activities have focused on the establishment and strengthening of the Nakai Plateau Village Forestry Association (NPVFA) to effectively undertake sustainable forest management and operate a profitable forest industry business to provide additional income and employment opportunities to resettled families able to carry out forestry business. Training and demonstration of alternative forest income generation activities is also under development in non-timber forest products (NTFP) and forestry inventory and border demarcation was carried out. Forest plantation, regeneration and fire patrol activities currently being carried out by villagers under the NPVFA supervision include weeding and maintenance of 2004 NTFP / timber plantations (42 hectares) and forest enrichment plantings (50 hectares). Retyping and remapping of the better quality forest, degraded forest and protection forest zones was completed and a permanent forest management area defined for long term sustainable forest management under a long term forest management contract and plan. Forest management contracts and long term forest management plans were signed on by the Government of Laos and the NPVFA in August.

All GOL licenses (except timber treatment) have been approved to allow the VFA to mobilize and commence production to produce timber for the resettlement housing and village community buildings next dry season.

Nakai Plateau Agricultural and Livestock Development Programme: An agro-pedological survey of the plateau was carried out by CIRAD during the period, resulting in a comprehensive mapping of the soil. These maps are

being used in the preliminary land and resource use planning (mentioned above). Follow-up consultant inputs are planned during the next six months to expand on the CIRAD report and further develop realistic and sustainable agricultural livelihood models.

The development of enhanced agricultural practices is scheduled to start this coming dry season for VG1, in parallel with the progressive creation of farm plots on new villages' areas. In the meantime, vegetable cultivation exercises were launched in 3 VG1 villages.

Fruit tree seedling production is on-going at the Nakai Neua Fruit Tree Propagation center with 13,500 seedlings produced to date.

Regarding livestock, a vaccination programme was launched in October, targeting buffaloes, cows and pigs. Pigs and poultry were also distributed to villagers, and the programme of animal registration continued. A bird flu awareness programme is also being prepared.

While day-to-day activities are continuing in Nong Boua Pilot village, a study tour to CIRAD/CCL project areas in other parts of Laos is being planned for staffs from NTPC, RMU and DWGs in January 2006. The study tours will provide guidance to staffs and will show evidence of successful livelihood programmes currently being implemented in other parts of Laos - which will provide a useful comparison and potential complement to the pilot village approach. Conclusions shown from the study tour will also provide for alternative models for methodology / approach on consultation with villagers concerning the land use planning for each village.

In total, five livelihood options are considered including agriculture, forestry, livestock, fisheries, and non-farm activities.

(c) Topographic survey and mapping of indicative locations

The topographic survey and mapping of all the new VG1 resettlement areas are complete, and nearly complete for the VG2 areas (move in 2007) including the installation of 3 Nakai Reservoir full supply level beacons at the most southernmost area, access difficulties due to the heavy rainfall this year rainy season prevented their earlier installation.

(d) Infrastructures

Planning for sourcing of timber for construction is being finalized and coordinated with salvage logging operation of GOL.

Other resettlement infrastructure related activities that have been conducted during the period included the finalization of village layout design, preparation for UXO clearing, design and cost estimates for roads and drainage, and preparation for the implementation of irrigation system and domestic water supply and sanitation throughout the resettlement areas.

Prefeasibility studies of Nam pan irrigation scheme were presented and agreed by the local District Governor and Department of Agriculture and Forestry officers. NTPC organized the sampling of water at the proposed site to verify the feasibility of irrigation.

An agreement was reached between all the parties to proceed with the recommended scheme as proposed by NTPC, with the understanding that the option of incorporating fish ponds into the distribution system be considered by NTPC.

Rehabilitation of Road 12 crossing the resettlement area from North to South was slightly delayed because of the heavy rain at the beginning of the period,

By December, substantial progress had been made. VG1 resettlement being delayed, it will allow to complete the rehabilitation of road 12 on time for the beginning of the actual resettlement.

4.4.2 Early Implementation of Certain Resettlement Activities

(a) Nong Boua Pilot Village

During the period, resettlement activities on the Nakai Plateau continue to concentrate on finalizing the design and construction of community infrastructure at the Nong Boua Pilot Village, and the improvement of the livelihood (crop production and livestock) capacity of the resettlers. Routine extension activities are undertaken on vegetables production, tree seedlings and tree plantation areas and forest patrol by the villagers. Irrigation water distribution has been improved and demonstration / trial farms have been further strengthened improved to ensure reliable services to new resettlers in the future. Agricultural extension centers at Nong Boua, Theun Douane and Nakai Neua focused on fertilizing, weeding, harvesting and mushroom production. Village resettlement committees are being formed.

The basic infrastructure development for Nong Boua pilot village is near completion, with Nursery school, primary school, teachers' housing, meeting hall, village office and warehouse constructed during the period.



Beginning of School year 2005-2006 at the Nong Boua School – The Nong Boua School has de facto become one of the main education infrastructure in the Nakai District

***On 16th September,
hand over pupil suit
(one pupil/2 suits)
and material for pupil
year 1 to year 5 (80
pupils)***



(b) Oudomsouk

A specific Resettlement Action Plan has been established for the village of Oudomsouk on the Nakai Plateau. Approximately 50 houses have been constructed by December 2005 and villagers will move in early 2005 to allow the construction of a saddle dam in Oudomsouk (see Project Lands section above).

Initial water testing for restaurants in Nakai was carried out. The results of five samples taken from different restaurants show minimal or no contamination.



***Construction of Primary School in
Oudomsouk***

General view of construction of replacement timber houses for SD12B PAP.



4.5 DOWNSTREAM AREAS DEVELOPMENT PLANS

The NTPC Project Lands / Downstream Programme Manager and two community development specialists have been appointed in August 2005.

Additional consultation was conducted in some villages in the Xe Bangfai and below the Nakai Dam site to initiate discussions over compensation and mitigation options for the expected adverse impacts to livelihood. In particular, a pilot village was identified in the Lower Xe Bangfai and has been used for intensive consultations over compensation options. Good progress has been made through those consultations that will also contribute to the preparation of the manual.

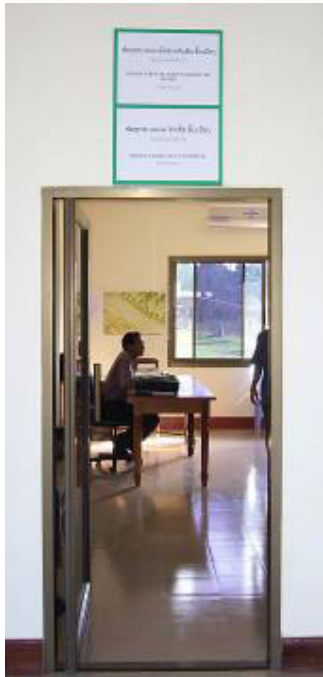
A joint venture of private companies has been appointed as Downstream Consultant to develop the “Downstream Restoration Programme, phase I”, focusing on 20 representative villages. Key elements of the consultant terms of references include:

- design of the asset restoration programme;
- design of the community fisheries management plan;
- design of the livelihood restoration programme;
- identification of works, goods, training, and TA needs; and
- formulation of a detailed implementation plan for the 20 villages; and
- formulation of a detailed implementation plan for the Downstream Programme for the years 2007, 2008 and 2009 including institutional systems for final distribution
- Further to review by IFI and approval by GOL in early 2006, implementation of the Downstream Programme is scheduled to start in May.

4.6 GRIEVANCE MECHANISMS AND STATISTICS

Two Grievance offices have been set up (one in Nakai, and the other in Gnommalat), allowing villagers impacted by the construction activities to express their concerns or requests.

Permanent mechanism and channel of communications between the local population and Project authorities have been established. Regular flow of information has been circulating during the period.



Above: Grievance office at Nakai



Right: Summary table of villagers' grievance lodged

ສະຫຼຸບຕົກລົງຂອງພູມ

ລ/ດ	ວັນທີ	ເລື່ອນໃບຕົກລົງ	ຜູ້ກ່າວ	ບັນດາບັນຫາ	ສະຖານທີ່	ສະຖານທີ່
1	28/05	ບໍ່ສະເໜີໃຫ້ຊ່ວຍເຫຼືອເພື່ອປະຊາຊົນ		ບໍ່		
2	30/6/05	ບໍ່ສະເໜີໃຫ້ຊ່ວຍເຫຼືອເພື່ອປະຊາຊົນໃນເມືອງ	ຜູ້ກ່າວ		ສະຖານທີ່ - ໄທ	
3	30/10/05	ບໍ່ສະເໜີໃຫ້ຊ່ວຍເຫຼືອເພື່ອປະຊາຊົນ	ຜູ້ກ່າວ		PMU + DNG	
4	5/8/05	ບໍ່ສະເໜີໃຫ້ຊ່ວຍເຫຼືອເພື່ອປະຊາຊົນ	ຜູ້ກ່າວ		ສະຖານທີ່ - ໄທ	
5	3/11/05	ບໍ່ສະເໜີໃຫ້ຊ່ວຍເຫຼືອເພື່ອປະຊາຊົນ	ຜູ້ກ່າວ		ບໍ່	

ນາກອນ, ວັນທີ 8/11/05
ຜູ້ກ່າວ:
ບັນດາ:

The above table in Lao language is organized as follows:

Column 1: Record No.

Column 2: Date

Column 3: Nature of grievance

Column 4: Problem solved

Column 5: Problem not yet solved

Column 6: Party responsible

Column 7: Other Comments

The above table refers to a series of complaints made by the villagers. Nature and status of the grievances are as follows:

- The Phonphanpek village, which is situated close to the water intake, reported that the civil work contractor has placed spoil from the headrace channel in the village fish pond. The village chief requested that either a new fish pond be provided or, by way of alternative compensation, wells be repaired or new wells be provided. The latter option seemed however to be favored by the village as in item 5 of the table, the village chief put a new request to help solve the problem of insufficient water in the wells, which is claimed caused by the headrace channel excavation. Corrective measures are presently implemented.
- The second point of the table concerned material damages to village roofs during the excavation at the intake channel. Phonphanpek village asked for repairs of damaged roof to be paid by the contractor. Since the claim, repairs were paid and NTPC asked the contractor to revise his blasting procedures, which it did.
- During preliminary resettlement activities for Saddle Dam 12, it appeared that a particular house in Oudomsouk village was located on land that belonged to another party. Some issues arose regarding compensation payments, which have since been resolved.
- In point 4, a direct request is made by an Oudomsouk village representative to the Project authorities to maintain the road in Oudomsouk in good condition. This request has then been taken into consideration.

**Grievance Procedure
Poster in Lao
language**



5 ENVIRONMENTAL ACTIVITIES

5.1 WILDLIFE PROGRAMMES

(a) Asian Elephant Programme

The Asian Elephant Programme started in March 04. An interim report was issued by the Wildlife Conservation Society (WCS) in September. Though this report does not yet contain analysis of the data that has been collected so far, it mentions that 89 recce-transects have been undertaken since March 04 and 524 elephant dungs monitored. Line transects will be started in the dry season 05-06. 43 human-elephant conflicts have been recorded so far. A detailed report is expected in early 2006 once cost sharing arrangements are finalized, which should address:

- Pre-impoundment inventory and survey of habitats, distribution, movements.
- Training of local authorities in conflict response and emergency response.
- Establishment and implementation of an elephant conflict response team.

NTPC and WCS have agreed to extend the first phase of the programme until May 2006. The second phase of the programme, which will relate to the management of populations of elephants in relation with the impoundment of the reservoir, is in the procurement process.

(b) Other wildlife programmes

In addition to the Phase 2 Asian Elephant Programme, request for Proposals for all remaining programmes have been advertised in September 2005 and expressions of interest are now being assessed. These programmes are to be launched by February 2006, and will include:

- **Fish Impacts in upstream and downstream river species**

- Species and habitat inventory in Nam Theun (NT) and Xe Bangfai (XBF)
- Monitoring of fish productivity
- Fish migration studies in NT, NPA and XBF
- NT habitat and flow studies
- Modification of downstream NT habitat
- Implementation of flow adaptive management programme and related activities
- Incorporating river protection into the management of the NPA and Corridors

- **Terrestrial animals in the inundation area**

- Pre-impoundment species and habitat inventory, distribution and movement
- Post-impoundment species and habitat inventory, distribution and movement (non-inundated part of the Nakai Plateau)
- Development and implementation of a post-impoundment species management programme

- **Transitional Strategy for Reservoir Impoundment**

- Development of a strategy and measures targeting wildlife during salvage logging of the Nakai Reservoir.
- Implementation of measures during salvage logging.
- Development of a transitional strategy for reservoir impoundment.
- Training of local authorities in wildlife emergency response.
- Establishment and implementation of an emergency response team.
- Public awareness programme.
- Prevention and prohibition of wildlife trade.

During the period, measures have already been taken to raise awareness on the illegal nature of wildlife trade of endangered species. Moreover, NTPC and Consultant contract employments have been amended to ensure that all NTPC employees and Consultants working for NTPC are aware of the illegal nature of such trade and that they would be automatically dismissed if they are found involved in such activities.

- **Impacts due to reservoir formation**

- Pre-impoundment species and habitat inventory, distribution and population.
- Development of a strategy for species and habitat management after impoundment.
- Implementation of habitat and species management programme.
- Implementation of biodiversity aspects of reservoir management plan.
- Patrolling of special conservation areas (WMPA).
- Post-impoundment monitoring of populations and distribution.
- Post-impoundment reservoir fish productivity and species monitoring.

- **Adaptive Management Programmes**

Not yet applicable.

An Adaptive Management approach will be implemented for the following programmes:

- Wildlife Programme (all components)
- Riparian release downstream of the Nakai Dam
- Water release in the Nam Kathang
- Water release from the regulating pond to the downstream channel

5.2 WATER QUALITY MONITORING AND ASSESSMENT PROGRAMME

During the period, NTPC monitored water at eight surface water sampling sites on a monthly basis. Quality parameters includes the consideration of water temperature, pH, dissolved oxygen, conductivity, turbidity, total suspended solids, alkalinity, ammonia-nitrogen, nitrate-nitrogen, nitrite-nitrogen, Kjeldahl nitrogen, potassium, sodium, manganese, total iron, lead, calcium, magnesium, silica, sulphate, chloride, total mercury, arsenic, biological oxygen demand, chemical oxygen demand, thermotolerant (faecal) coliform and total phosphorus.

***Samples collection
beginning of
September 2005.***

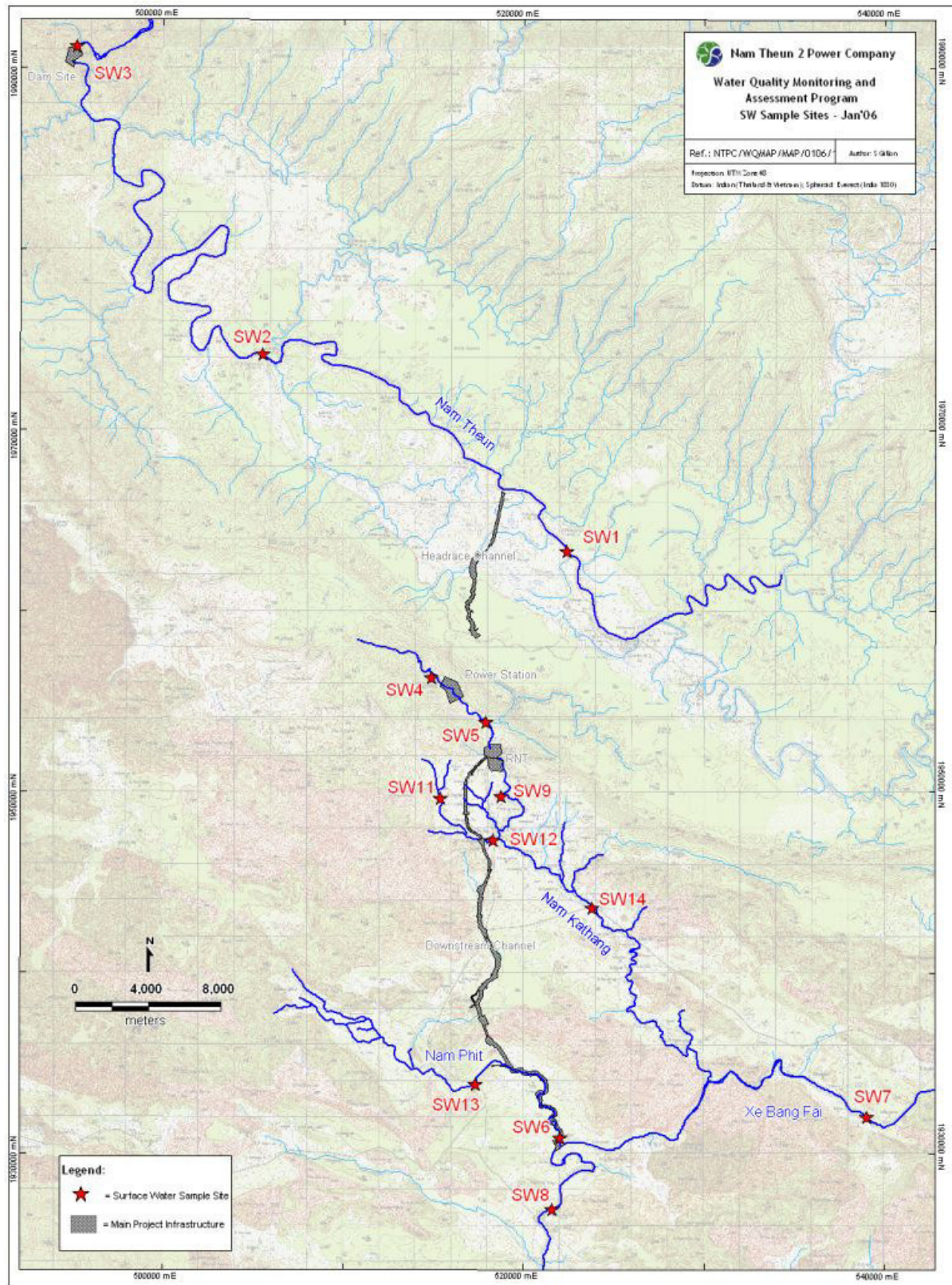


Field observations (Surface Water or SW sampling) noted high turbidity in the Nam Kathang caused by sediment loaded discharge from the power station construction area during heavy rainfall events. More generally, the main inferences of potentially problematic water quality during the period can be summarized as follows:

- Turbidity and total suspended solids both exceeded their respective ANZECC guideline at all sites in August (including the upstream control site (SW4)) along the Nam Kathang. Further investigation identified impacts at SW4 from both swidden agriculture and construction activities on the Nakai Plateau escarpment upstream of the SW4 sampling site. The location on the Nam Kathang upstream control site was therefore relocated for the September 2005 sampling event. Given the unusual amount of very fine particles in the water flowing out of the construction sites (especially underground works), some sediments ponds has proven to be undersized, and that the HC is considering both (i) re-design the sedimentation ponds, or (ii) use appropriate flocculants.
- Nitrite exceeded its ANZECC guideline at SW5 downstream of the power station construction area. Elevated nitrite is consistent with increased run-off caused by heavy rain in the Project area prior to sampling. The source of this elevated nitrite might be anaerobic conditions developing in the construction areas and in particular within the sedimentation basins.
- Faecal coliform levels have decreased below the ANZECC guideline in the Nam Phit and Xe Bangfai but continue to exceed the guideline in the Nam Theun and Nam Kathang. For the Nam Theun, this elevation was considered representative of wet season conditions and reflected the inadequate sanitation facilities in the communities residing along the Nam Theun.
- Sodium magnesium, silica and sulphate concentrations at SW5 downstream of the power station all exceeded their respective acceptable control range. Although levels still remained within their ANZECC guideline, the sharp increase (between 2-fold and 10-fold) in these parameters over a relatively short stretch of river indicates that the

Nam Kathang is being impacted by run-off from construction areas and leachate from the spoil disposal areas located adjacent to the Nam Kathang.

Map of Water Quality Sampling Sites

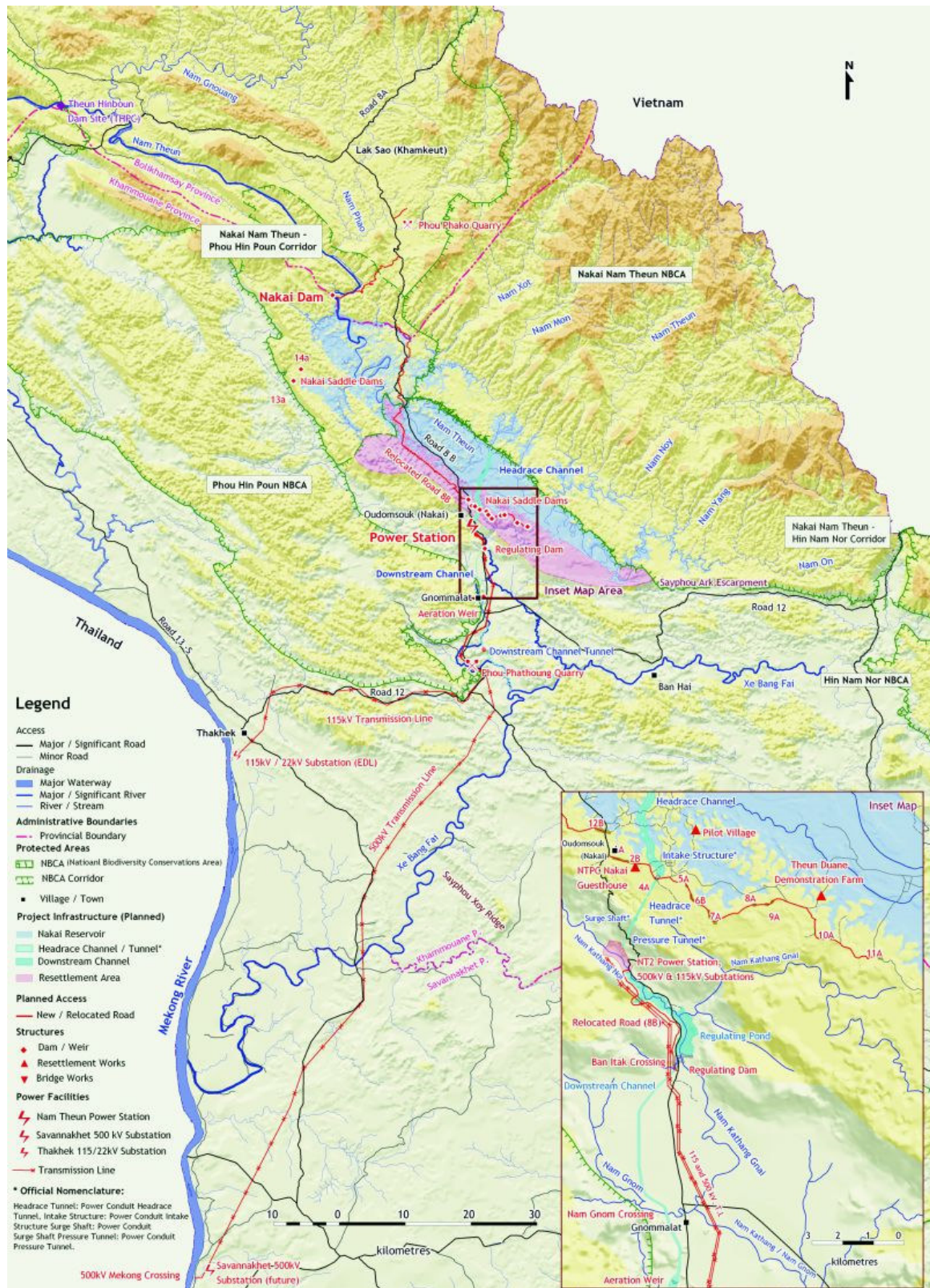


LIST OF ABBREVIATIONS

CA	Concession Agreement between the GOL and NTPC
CW	Civil Works contracts, being CW1, CW2 and CW3
DCCA	District Committee for Control of AIDS
DOI	Department of Irrigation
DRF	Drug Revolving Fund
DSRP	Dam Safety Review Panel
EAMP	Environmental Assessment Management Plan
EDF	Electricité de France
EDF-CIH	Electricité de France's Centre d'Ingenierie Hydraulique division
EDFI	EDF International
EDL	Electricité du Laos, the offtaker under the EDL PPA
EDL PPA	Power Purchase Agreement to be entered into between EDL and NTPC
EGAT	EGAT Public Company Limited (EGAT Plc.), the offtaker under the EGAT PPA
EGAT PPA	Power Purchase Agreement to be entered into between EGAT and NTPC
EGCO	Electricity Generating Public Company Ltd
EM	Electromechanical Works contracts, being EM1 and EM2
EMO	Environmental Management Organisation of NTPC
EMU	Environmental Management Unit of GOL
FSL	Full Supply Level, the maximum water level in the reservoir for which operation of the Project can be safely undertaken
GOL	Government of the Lao PDR
GW	Gigawatt
GWh	Gigawatt Hour
HC	Head Contractor
HCC	Head Construction Contract
IAG	International Advisory Group
ICR	Institute of Cultural Research
IMA	Independent Monitoring Agency
ICHC	Integrated Community Health Center
ITD	Italian-Thai Development Public Company Limited
IUCN	International Union for Conservation of Nature
Kip	The lawful currency of the Lao PDR
kV	Kilovolt
kW	Kilowatt
kWh	Kilowatt Hour
LE	Lender's Engineer

LPA	Land Parcel Area
Lao PDR	Lao People's Democratic Republic
masl	Meters above sea level
MOH	Ministry of Health
MOL	Minimum Operating Level, the minimum water level in the reservoir for which operation of the Project can be safely undertaken
MoU	Memorandum of Understanding
MW	Megawatt
MWh	Megawatt Hour
NT2	Nam Theun 2 or the Project
NPA	National Protected Area
NTPC	Nam Theun 2 Power Company Limited
PAP	Project Affected People
PCCA	Provincial Committee for Control of AIDS
PMF	Probable Maximum Flood
POE	Panel of Experts
Project	Nam Theun 2 hydroelectric power project
RAP	Resettlement Action Plan
SDP	Social Development Plan
SEMFOF	Social and Environmental Management Framework and Operational Plan
SESIA	Summary Environmental and Social Impact Assessment
Shareholders	EDFI, LHSE, EGCO and ITD
Sponsors	EDF, EGCO and ITD
THB	Thai Baht, the lawful currency of the Kingdom of Thailand
USD or US\$	US Dollar, the lawful currency of the United States of America
WCS	Wildlife Conservation Society
WMPA	Watershed Management and Protection Agency

MAP OF PROJECT SITE



MAP OF VILLAGES RELOCATION ROUTES

