

LAO PEOPLE'S DEMOCRATIC REPUBLIC
NAM THEUN 2 MULTIPURPOSE PROJECT

TENTH REPORT OF THE
INTERNATIONAL ENVIRONMENTAL AND SOCIAL
PANEL OF EXPERTS

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**For the Nam Theun 2 Project
Lao People's Democratic Republic
October 30 2006**

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Front Cover Photo: Resettled family in transition housing, waiting for permanence, new Ban Sop Hia.

SUMMARY OF RECOMMENDATIONS

1. INSTITUTIONAL ISSUES

The POE recommends that:

1. The time is long overdue for the Government of Laos to strengthen the current NT2 Steering Committee and Secretariat by providing the Committee with decision-making authority under the leadership of Deputy Prime Minister Mr. Somsavath Lengsavat and providing the current Secretariat with the necessary staff and budget.
2. NTPC act firmly to ensure that there is effective interaction, including consultation and timely preparation and review of environmental documents and plans, between and among the Head Contractor, the sub-contractors and the NTPC Construction and Environmental and Social Teams.
3. NTPC and GOL develop the necessary reservoir, downstream and project lands institutional structures as a matter of urgency.
4. NTPC recruit now another data management adviser and ensure that all relevant data sets (WMPA, Nakai Plateau and Downstream) be made compatible with, and incorporated within, a single information management system, and further that NTEC's 1998 random sample of dam-affected households on the Nakai Plateau be incorporated within the Nakai Resettlement Monitoring system.
5. Measures to strengthen the GOL's environmental monitoring and enforcement machinery, notably the Environmental Monitoring Unit, be devised and introduced, with precedents elsewhere for ensuring compliance and enforcement being examined for their usefulness as models and the existing system of statutory environmental controls being extended in scope and impact.
6. The highest priority be placed by the GOL and the World Bank on ensuring that there are effective external monitors on the ground by the time of the next POE visit in January 2007.

2. ENVIRONMENTAL IMPACTS AROUND CONSTRUCTION SITES

The POE requires that:

- 7 First, the Head Contractor must produce a specific environmental assessment and environmental protection plan for the camp site including the sewage disposal, in consultation with and with the agreement of the NTPC Construction Team and the Environmental and Social Teams, and with the POE's written agreement. Second, the plan must be implemented on the ground, concurred by the NTPC teams, and POE must be given adequate proof of this. Third, there must be written agreement from the Head Contractor that the agreed number of camp occupants cannot be exceeded without concurrence of NTPC and the POE. Only then will the POE approve a specified increase in the number of laborers at the camp above the originally-agreed 650.**

The POE strongly recommends that:

- 8 In the interim the revised specifications for the dam site road be strictly adhered to, lateral draining be introduced, disturbance be limited to the road easement and the abandoned sections of road be restored and revegetated. This work should be closely supervised by the Head Contractor and NTPC staff.**

The POE recommends that:

- 9 The Head Contractor and the NTPC itself closely supervise the work on the new road to the northern resettlement villages to avoid another costly rehabilitation exercise and to restrict the impacts of the work on the forest areas assigned to the resettlers. Revegetation and reforestation plans must be approved for those areas already damaged by excessive clearance and their implementation overseen by the Company.**
- 10 NTPC and the Head Contractor take a very close interest in both the design and construction of the cross-reservoir road and insist on the timely provision of a conservative vegetation clearance plan, detailed drainage and water movement plans and a revegetation/reforestation plan. Work should not begin until these plans have been approved. WMPA should be consulted in the development of plans affecting the NPA.**
- 11 Implementation of a state-of-the-art environmental plan be a requirement for any labor camp(s) associated with the cross-reservoir road, the Ban Thalang labor camp be removed once bridge construction is complete, any enlargement of the existing camp along road F be accompanied by the necessary environmental precautions including sewage disposal and no such camps be established within the NPA.**

- 12 **The success in reducing turbidity through flocculation be followed up fast in the many sedimentation ponds around the project.**
- 13 **The sooner the rehabilitation of spoil disposal areas is undertaken the sooner the areas will consolidate, so this work should not be postponed unduly. The CA calls for spoil disposal area plans---these should be submitted for approval with dispatch.**

3. NT2 RESERVOIR RESETTLEMENT

The POE recommends that:

- 14 **Henceforth increasing priority be given to livelihood activities, including crop agriculture, livestock management, fisheries and off-farm employment activities, in the already resettled villages.**
- 15 **NTPC management convene for all social advisers at the earliest possible date a workshop or workshops whose function is to thrash out differences of opinion to management's satisfaction.**
- 16 **No further "unauthorized households" as opposed to vulnerable individuals be authorized to join resettler villages on the Nakai Plateau.**
- 17 **Government family planning services be more carefully tailored to meet the existing and presumably growing demand at the village level among younger women for smaller families.**
- 18 **The World Bank recruit an ethnic specialist no later than October 2006 to carry out the necessary consultations and to make recommendations based on those consultations as to the siting of a Vietic village on the Nakai Plateau if so desired by Vietic households and procedures for enabling those Vietic households who so desire to return to the NPA.**
- 19 **NTPC and the VFA General Manager give priority to building up the supply of VFA sawn timber for resettlement housing, using non-VFA sawmills in the meantime and accelerating the process of bringing the new VFA mill into production as soon as possible.**
- 20 **Planning begin now to build up management expertise in the VFA (with understudies appointed to work alongside the experienced General Manager) so that the villagers may resume control of their forest resources on schedule in December 2008.**
- 21 **Maximum use be made of the opportunities over the next two years for the resettlers to obtain employment, build up harvesting and processing and forest**

management expertise, and add to their income through participation in the drives to produce housing timber and clear the reservoir.

- 22 Further advice be sought as a matter of urgency on the inter-relationships between residual bio-mass in the reservoir, water quality and fisheries and hence what quantities of bio-mass should be burned, removed or left intact in the period before inundation.
- 23 There be an explicit assignment by GOL of direct responsibility for reservoir clearance (beyond the logging operations) to a GOL agency or agencies with the necessary competences, powers and resources.
- 24 NTPC's nutrition and agricultural/horticultural specialists seek affordable solutions to the nutrition gap among the under fives in particular.
- 25 Health planners be made aware of the sustainability issues surrounding expanding birth/survival rates and move to be more pro-active in making contraception and sterilization options---where sought---more freely accessible to male and female villagers. All health clinic and mobile health clinic workers should be trained in family planning techniques and District Hospitals as well as Provincial Hospitals should have a sterilization capacity.

4. THE XE BANG FAI BASIN

The POE recommends that:

- 26 The Government of Laos request UNDP and the World Bank to convene a Round Table meeting of prospective donors and other relevant agencies to discuss how best to proceed with a well coordinated and funded Xe Bang Fai basin initiative.
- 27 The pending hydrology report on downstream flow fluctuations and related issues being prepared by the NTPC's Daniel Gunaratnam be fast-tracked and made available for public debate as soon as possible to clear up the uncertainties.
- 28 NTPC promptly take the lead in determining the most reliable option for gravity flow irrigation in the Gnommalat District and in the planning and implementation of that option.

5. THE WMPA AND THE NPA

The POE recommends that:

- 29 WMPA continue development of the Watershed Access Strategy. The Strategy must be set within the framework provided by the Concession Agreement

(CA) and the SEMFOP, and must involve meaningful and effective consultation with the villagers.

- 30 WMPA ensure that there are Lao counterparts to take over when the TAs' terms are completed; and that WMPA act on Dr. Robichaud's proposal that two or more Lao biologists undertake their Ph.D. research in the NT2 area to be mentored by him, with the agreement that they would continue his work after he leaves.**
- 31 GOL pull together the necessary research, assemble an authoritative presentation and apply for World Heritage status for the NPA without further delay, drawing inter alia on the expertise in the WMPA Secretariat.**
- 32 GOL develop and exert substantially more effective control over illegal wildlife exploitation, and that it ensure that Lao legislation and actions are consistent with the requirements of the CITES Convention.**

6. MACRO-ECONOMIC IMPACTS OF THE NT2 PROJECT

The POE recommends that:

- 33 GOL requests World Bank assistance in undertaking the necessary micro and macro economic studies.**

INTRODUCTION

The Panel, its Role, Objective of this Mission, Acknowledgments

This is the tenth report of the International Environmental and Social Panel of Experts (POE or the Panel) for the Nam Theun 2 (NT2) Project in the Lao People's Democratic Republic. The Panel's previous reports covered visits to Laos from January/February 1997 to January 2006. The Panel and the International Advisory Group of the World Bank (IAG) issued a report on a joint mission to Laos in August 2005. The members of the Panel are D.K.McDowell (consultant, Otaki, New Zealand), T.Scudder (California Institute of Technology, USA) and L.M.Talbot (George Mason University, Virginia, USA).

The Concession Agreement covering the project enshrines as a contractual right, applying to both the Government of Laos (GOL) and the Nam Theun 2 Power Company (NTPC), the Panel's responsibility to provide independent review of, and guidance on, the treatment of environmental and social issues associated with the project. The Concession Agreement also accords the Panel compliance, supervision and a number of enforcement functions in respect of the environmental and social activities and obligations of the parties. It is required to act independently of the parties and in a manner which best protects the environment and the interests of those impacted by the project.

The Panel's findings and recommendations are submitted to the Minister of Mines and Energy of the GOL as Chair of the NT2 Steering Committee of the GOL, which is a committee of the Lao National Committee on Energy chaired by the Deputy Prime Minister. The POE may also address comments and recommendations to the NTPC and its reports are also made available for distribution to the World Bank, the Asian Development Bank and other cooperating organizations and the public. The Panel is free to make its own determination on which environmental and social issues it should focus and has the final say as to what is incorporated in its reports.

The Panel's area of responsibility includes the entire Nam Theun Basin from the border of Vietnam to the Mekong River, the Nakai-Nam Theun National Biodiversity Conservation Area (NNT-NBCA or the NPA) which includes the NT2 project catchment area, inter-basin transfers from the Nam Theun to the Xe Bang Fai and Nam Hinboun river basins, the NT2 transmission line and whatever enhancement and other projects are impacted upon by water releases from the Nam Theun reservoir. The Panel is also obligated to assess the extent to which the NT2 project meets relevant World Bank and Asian Development Bank safeguard policies including, but not restricted to, those for the environment, indigenous people, and resettlement with development.

Objective of this Mission and Panel Activities

At the conclusion of the January 2006 mission, the NTPC and the GOL requested a second visit by the Panel during the year to follow up on the comprehensive list of recommendations made by the Panel in January particularly as they related to resettlement. The members arrived in Vientiane on 6 August 2006. The first two days were spent in Vientiane meeting with relevant Ministries and agencies of the GOL, NTPC, World Bank, and the new Ministers of Mines and Energy, and Agriculture and Forestry. The Panel then drove to Thakhek for briefings on the Downstream and Health and Safety Programs and a meeting with the Khammouane Governor. The next six days were spent on and around the Nakai Plateau, taking in visits to all the new resettlement villages, the pilot village, the dam site, construction roads and the new logging road above Thongkong village, the powerhouse and associated works, the Downstream Channel and tunnel, and Xe Bang Fai sites including Bung Xe village. The Panel spent a day attending a Watershed Management and Protection Authority (WMPA) workshop of watershed and PIZ village heads participating in program and budget planning and had discussions with the Minister of Mines and Energy---also visiting the project---the Nakai District Governor, the Head Contractor and the various officials and Company specialists dealing with resettlement, the environment and other impact sectors, plus comprehensive talks with resettled villagers.

On return to Vientiane the Panel spent 16-19 August reviewing and discussing its findings with representatives of GOL, NTPC, World Bank, ADB, Agence Francaise de Developpement and other stakeholders. In addition to the Minister for Mines and Energy the Panel held a most useful discussion with Deputy Prime Minister Somsavath Lengsavat.

Acknowledgments-Appreciation

The Panel wishes to acknowledge with gratitude the information, advice and assistance received from all to whom we spoke during the mission. Special thanks are due to the Minister of Mines and Energy, Hon. Bosaykham Vongdara, to the Deputy Prime Minister, Hon. Somsavath Lengsavat, who gave generously of his time, to the Minister of Agriculture and Forestry, Hon. Sitaheng Latsaphonh, and to the Secretariat of the Lao National Committee on Energy to which we reported and especially to the Secretariat's Xaypaseuth Phomsoupha and Sychath Boutsakitirath.

Efficient arrangements were made for us in the field by the LNCE Secretariat, and by Bernard Tribollet, Michael Beauchamp, Phalim Daravong and other staff of NTPC, by WMPA staff, and by the Khammouane Province and Nakai District staff. We are grateful for the welcome accorded us by the Governor of Khammouane and the Governor of Nakai and for the arrangements made by village officials who enabled the Panel to visit the resettlement villages---to say nothing of the village residents who were very open with us throughout the project area.

1. INSTITUTIONAL ISSUES

1.1 Need for a Stronger NT2 Oversight, Decision-making and Coordination Structure

The time is long overdue for the Government of Laos to provide the current NT2 Steering Committee with decision-making authority, and an adequately staffed and budgeted Secretariat. The current institutional structure has been unable to realize the NT2 project's potential for achieving major multiplier effects and for serving as a pilot project for integrated river basin and regional development elsewhere in Lao PDR. For example, the assumption that the NT2 Steering Committee could deal with such complex inter-Ministry issues as monitoring reservoir clearance of woody biomass proved unrealistic because a key Ministry (Communication, Transport, Post and Construction) was not a member.

Chaired by Deputy Prime Minister Somsavath Lengsavat, the Committee membership should include senior ministerial, provincial and other representatives from key agencies. Authorized to operate at a national level, such a Committee should have, as one example, the authority to work with UNDP's "round table" function to convene donor meetings to identify development opportunities in need of donor assistance and to better coordinate what assistance is available.

During the ten years that the POE has been coming to Laos, NT2 has become the nation's number one development project, as well as a project that has stimulated increased international investment at the national level. Furthermore, over the years NT2 has evolved from being a major hydropower project to being a major multipurpose one with significant potential for catalyzing development at district, provincial, and national levels. That potential includes both direct benefits as well as the type of multiplier effects that have characterized well-planned and well-implemented large dam projects elsewhere (see, for example, Cestti and Scatasta's 2003 "Toward a Full Assessment of the Impact of Dams: Improving Our Understanding of Indirect and Induced Impacts. World Bank Paper"). Realization of that potential, however, requires the type of decision making authority and coordination that the POE has found lacking in existing institutions in Laos.

The POE recommends that:

- 1. The time is long overdue for the Government of Laos to strengthen the current NT2 Steering Committee and Secretariat by providing the Committee with decision-making authority under the leadership of Deputy Prime Minister Somsavath Lengsavat and providing the current Secretariat with the necessary staff and budget.**

1.2 Responsibilities of the Head Contractor and Sub Contractors

The normal procedure for development projects is for the contractor to be responsible to the owner. In NT2 the guiding contractual document is the Concession Agreement which, along with the International Finance Institutions, requires that construction adhere to environmental and social considerations. In January and again this visit it was made clear to the POE that the Head Contractor operates essentially independently, taking decisions and actions without much – if any – consultation with the NTPC Environmental and Social and Construction teams, and even on occasion without informing them or the head office of the NTPC.

A relevant example is the increase in the number of laborers and other environmental issues at the dam site labor camp. Other examples are the dam site road and the road to the northern resettlement areas. The effect of these independent actions on the part of the Head Contractor and/or subcontractors is that there may be failure of the construction activities to adhere to some of the environmental and social requirements of the CA.

The POE recommends that:

- 2. NTPC act firmly to ensure that there is effective interaction, including consultation and timely preparation and review of environmental documents and plans, between and among the Head Contractor, the sub contractors and the NTPC Construction and Environmental and Social Teams**

1.3 Ensuring that Catch-up Emphasis on Transitional Resettlement does not Cause Delayed Planning and Implementation of Nakai Plateau, Project Lands and Downstream Xai Bang Fai Livelihood Activities

GOL and NTPC must be more alert to the risk that the “catch-up” emphasis paid to Nakai Plateau resettlement is delaying creation of the necessary institutional structures for planning and implementing livelihood and social activities elsewhere. On the Nakai Plateau, for example, the required reservoir authority has yet to be created even though backwater effects of the coffer dam are already interfering with movement between the NT2 catchment area and Nakai District headquarters.

In the Xai Bang Fai river basin, the entire downstream program is at risk because of the ongoing failure to establish the recommended Project Management Unit with the necessary NTPC, Resettlement Management Unit (RMU), and District Staff. According to the Final Main Report of the NT2 Downstream Restoration Program, Phase 1, the staffing detailed “is absolutely needed and must be hired by April/May 2006. Office space must be found, and procurement of all vehicles, office telephone equipment in early March 2006. The success or failure of the Downstream Livelihood Restoration is going to depend on the establishment of this Unit by April/May 2006” (page 332-333). These activities have yet to occur.

Resettlement Action Plan 3 deals with Gnommalat and Mahaxai Districts where all of the project lands households (190 of 1,996) losing more than 50 percent of their livelihood live. An adequately budgeted institutional and organizational framework for dealing with their needs does not exist even though key time-bound decisions must be made. One such decision relates to the viability of gravity flow irrigation from the downstream channel. If viable, then decisions for placement of off-take structures are required before the completion of channel construction during 2007. If not viable, then alternate plans for substitute community irrigation need be investigated, planned and implemented.

The POE recommends that:

- 3. NTPC and GOL develop the necessary reservoir, downstream and project lands institutional structures as a matter of urgency.**

1.4 Data Management and Monitoring

The POE is concerned that NTPC's information management adviser will be resigning at a time when the Environment and Information Unit/GIS Team has been operational for less than two months and when the newly recruited socio-economist/statistician has yet to arrive. Cause for further concern is the fact that WMPA data sets have not been incorporated within the information management system. Nor, for that matter, has the WMPA developed its own data management system, let alone a compatible one.

The POE is also concerned that no decision has been made concerning how best to incorporate NTEC's 1998 Nakai Plateau "Bench-Mark" socio-economic survey into the Nakai Resettlement Monitoring (NRM) system currently being developed under the lead of Gunaratnam and Associates. Incorporation is important because by the time the first NRM survey is completed the NT2 project already will have had a major impact on resettler livelihood. Incorporation should not be too difficult. One approach would be to select according to the NRM's three wealth strata a relatively small number of named households that occur in both samples. Such shared households might, for example, form a sub sample for more frequent interviewing for adaptive management purposes.

The POE recommends that:

- 4. NTPC recruit now another data management adviser and ensure that all relevant data sets (WMPA, Nakai Plateau and Downstream) be made compatible with, and incorporated within, a single information management system, and further that NTEC's 1998 random sample of dam-affected households on the Nakai Plateau be incorporated within the Nakai Resettlement Monitoring system.**

1.5 Strengthening the GOL's Environmental Monitoring Machinery

With around seven more hydropower projects at the contractual stage and up to thirty more in the preliminary planning phase, plus a booming mining scene, it is very much in the national interest that the task of monitoring the environmental impacts of such massive development be taken over by Lao institutions as soon as possible.

In the case of NT2, the NTPC has added considerably to its own Environmental Management Organization (EMO), with most staff now on the ground near the project, and this is starting to produce results. But the need for Laos to have its own people in place and constantly on site remains.

With perhaps a third of the project construction completed the GOL's Environmental Monitoring Unit (EMU) is still far from being in full operational mode. The GOL is thus largely dependent at this point on NTPC to carry out on-site monitoring functions. This is not a satisfactory situation and presents potentially costly risks for the GOL---as it found when water pollution from an illegal gold mine precluded the Nam Pan site being used as a NT2 resettlement site. The costs---and the damage to the land, rivers and people of Laos---will grow in the years ahead if an adequate national environmental monitoring and enforcement system is not put in place to keep a close eye on all hydropower and mining projects.

Substantial investment in training and in establishing appropriate management structures and procedures for NT2 are set out in the Inception Report drawn up by Earth Systems Lao in June 2006. This is a sound document as it relates to the NT2 project. But a system which will meet future Lao needs at the national level for environmental protection and the most efficient use of the country's resources is called for. The POE suggests that achieving this involves more than expanding investment in human and other resources. What is also required is to give the monitoring agency real teeth. There are a number of models in the South East Asian region which might be further studied for their relevance to the Lao situation---and some systems further afield may also provide some helpful precedents.

The POE recommends that:

- 5. Measures to strengthen GOL's environmental monitoring and enforcement machinery, notably the Environmental Monitoring Unit, be devised and introduced, with precedents elsewhere for ensuring compliance and enforcement being examined for their usefulness as models and the existing system of statutory environmental controls being extended in scope and impact.**

1.6 Other monitoring agencies

Regrettably enough the POE cannot report much progress in setting up the external monitoring agencies called for in the CA, the notable exception being the WMPA monitoring system. Recruiting for IMAs is proceeding but, as we said six months ago, the failure to have the monitoring agencies on the ground this far into the project is appalling.

The POE recommends that:

- 6. The highest priority be placed by the GOL and the World Bank on ensuring that there are effective external monitors on the ground by the time of the next POE visit in January 2007.**

2. ENVIRONMENTAL IMPACTS AROUND CONSTRUCTION SITES

The construction record of the Nam Theun Power Company (NTPC) at the dam and powerhouse sites is impressive, a lagging schedule having been largely made up due in part to a drier than usual June. Its record in terms of environmental protection and mitigation is not in the same league. In the view of the POE there is not only a lack of internal coordination and communication in this sector of the Company's operations but the impression is emerging that taking environmental concerns seriously and doing something constructive and timely about them is not yet part of the corporate culture. We have been led to wonder on occasion whether those who felt that having the owner undertake the contract was a recipe for problems may have had a point.

2.1 Dam Site Labor Camp

In August, 2005, the POE and IAG visited Laos on the request of the GOL primarily to review and assess the revised proposal and plans for the labor camp at the NT2 dam site. After visiting the site and protracted discussions with NTPC the POE and IAG agreed to the establishment of the camp at its present location near the dam site, with a maximum number of 650 laborers and with several other provisions, including that there be no camp followers allowed.

From the present visit it is clear there are no camp followers, and NTPC and its contractors deserve very substantial credit for that important accomplishment.

In addition, we understand that about 80 percent of the labor force are from Laos, with recruitment favoring project areas. This, too, is an important success for which the company and its contractors deserve real credit.

On our January, 2006 mission, while visiting the dam and camp sites, we discussed the labor camp at length with the Head Contractor and we were assured that the camp would only hold a maximum of 650 laborers and that sewage and other environmental safeguards were taken care of. However, just prior to this present mission we learned that the Head Contractor had increased the number of laborers housed at the camp during this year's dry season to about 1,100, and that additional laborers were expected in the coming dry season.

During the present mission we asked NTPC why we had not been informed and consulted about this breach of agreement, and we were told that NTPC itself only learned of it just before we were notified. Further, at the present visit to the dam camp site we were told that construction for the additional laborers started only weeks after our January visit when we were assured that the agreed-upon 650 laborers was the limit.

Clearly the Head Contractor went ahead with this breach of agreement with no consultation, notification or agreement with the owner of the project, the POE or the IAG. In our view this is unacceptable.

At the present site visit we were assured by the Head Contractor that the footprint of the camp would remain the same regardless of the number of laborers, that there was tight security to protect the resources of the NPA, and that the sewage and other environmental safeguards were all in place. We need concrete proof of all this.

The sewage is a case in point. We were told about three separate ways that the sewage would be dealt with. We are not convinced any of them will work with the original 650 laborers, much less with approximately a doubling of their numbers. We were told by the Head Contractor that “we have a plan”. But we have not seen it.

The POE finds the increased number of laborers over the agreed-upon 650 unacceptable. At present the number of laborers is reportedly below 650 because of the wet season. Before the POE will agree to any increase over the 650 laborers in the camp we must have concrete proof that the footprint of the camp will remain the same, that the adjacent resources of the protected area are effectively protected, that the sewage and other environmental safeguards are all in place, that there will be no further increases in numbers without POE and NTPC concurrence, and that the Head Contractor will consult closely with the NTPC Environmental and Social Teams on the site.

The POE requires that:

- 7. First, the Head Contractor must produce a specific environmental assessment and environmental protection plan for the camp site including the sewage disposal, in consultation with and with the agreement of the NTPC Construction Team and the Environmental and Social Teams, and with the POE’s written agreement. Second, the plan must be implemented on the ground, concurred by the NTPC teams, and POE must be given adequate proof of this. Third, there must be written agreement from the Head Contractor that the agreed number of camp occupants cannot be exceeded without concurrence of NTPC and the POE. Only then will the POE approve a specified increase in the number of laborers at the camp above the originally-agreed 650.**

2.2 Roding impacts

The roading performance is a second area of serious concern. POE noted last February that the dam site road exceeded specifications in a damaging way and that the specifications themselves were inappropriate for a road going through steep country in a wildlife corridor in a developing country. The NTPC management with

the concurrence of the GOL responded positively, the specifications being amended to take account of our criticisms. The road was substantially rerouted and several sections situated on steep slopes above the Nam Theun were abandoned.

On revisiting the road this time, however, POE was not impressed with the application of the revised specifications by the subcontractor. The margins of even the newly constructed sections were still being excessively cleared of forest cover, erosion scars have appeared on many slopes, revegetation attempts have been inadequate and misguided (using shallow-rooting exotics) and in one or two places the road surface is cracking because of eroded margins. Spoil is often simply pushed off the roadbed and downhill, on occasion burying under several feet of spoil the root mass of the remaining large trees. Many will eventually die and thus extend the impacted area. And at this stage little attempt has been made to rehabilitate the abandoned sections of the road including sections poised precariously over the Nam Theun and a lengthy new loop of road which was also abandoned after big rocks were encountered. (Was it not surveyed?)

Viewing all this we are led to conclude that the subcontractor has only a limited understanding of how to use the natural contours of the land in a high rainfall area to lessen erosion and subsidence, of how to build effective lateral drainage systems to lessen the impact on slopes of big volumes of run-off, or of how to make use of the forest cover and floor as a protection from the impact of downpours.

The Company has brought in a revegetation specialist to attempt to restore ground cover, to begin reforestation and to advise on more effective drainage systems. We do not see how the soil accumulations above the Nam Theun can be retrieved and fear that most of it will end up in the river. The specialist's views are awaited with interest.

The POE strongly recommends that:

- 8. In the interim the revised specifications for the dam site road be strictly adhered to, lateral draining be introduced, disturbance be limited to the road easement and the abandoned sections of road be restored and revegetated. This work should be closely supervised by the Head Contractor and NTPC staff.**

Regrettably the subcontractor seems not to have learned the lessons of the dam site road. Sections of the new road to the northern resettlement villages are showing the same insensitivity to topography, to forest cover and floor and to drainage as the first road. Again small diameter timber is being bulldozed up to the forest edge and in one area at least being set fire to, eating further into the forest margins. The forest areas are vital to the livelihoods of the resettlers.

The POE recommends that:

- 9. The Head Contractor and the NTPC itself closely supervise the work on the new road to the northern resettlement villages to avoid another costly rehabilitation exercise and to restrict the impacts of the work on the forest areas assigned to the resettlers. Revegetation and reforestation plans must be approved for those areas already damaged by excessive clearance and their implementation overseen by the Company.**

Substantial work has not yet begun on the cross-reservoir road towards Laksao. Adequately designed multi-span bridges and causeways with wide-diameter culverts will be needed to provide unimpeded water movement and surface water mixing and to handle the wet season flow from the southern catchment. The so-called Thousand Islands area merits particular attention, having both high conservation and potential tourism values.

The POE recommends that:

- 10. NTPC and the Head Contractor take a very close interest in both the design and construction of the cross-reservoir road and insist on the timely provision of a conservative vegetation clearance plan, detailed drainage and water movement plans and a revegetation/reforestation plan. Work should not begin until these plans have been approved. The WMPA should be consulted in the development of the plans affecting the NPA.**

It is essential that problems associated with the Dam Site Labor Camp not be repeated with labor camps associated with the cross-reservoir road. There are two types of risks to avoid. One is to the environment; the other is to Ban Thalang and to the various villages that have recently been resettled nearby. Because of the conservation and development importance of the NT2 reservoir and of the Thousand Islands area, there is a need for an environmental assessment and environmental protection plan, including waste disposal, for any labor camp or camps associated with the design and construction of the cross-reservoir road. Such an assessment and plan also need pay special attention to where the camp or camps are sited. The POE has already informed NTPC's Health Program Management Unit of its concerns that the siting of the bridge labor camp beside Ban Thalang is having an adverse effect on the village. On the completion of the bridge, that camp should not be enlarged to accommodate the labor force for the cross-reservoir road. Rather it should be closed down, with the cross-reservoir labor camp sited elsewhere.

On October 8, 2006 the POE received from NTPC an interim report on "NT2 environmental impacts around construction sites". Page 2 of that report stated that the "Head Contractor informed us that should they need to have more than 650 people at the dam site in October (and until POE agree to a higher number), additional numbers will be accommodated at the existing camp along road F

(outside the corridor).” In that event, of course, appropriate environmental and social policies should be implemented at this site also.

The POE recommends that:

- 11. Implementation of a state-of-the-art environmental plan be a requirement for any labor camp(s) associated with the cross-reservoir road, that no such camps be established within the NPA, that the Ban Thalang labor camp be removed once bridge construction is complete, and that any enlargement of the existing camp along road F be accompanied by the necessary environmental precautions including sewage disposal.**

2.3 Powerhouse and Associated Works Impacts

The POE visited these sites briefly but did not undertake a thorough inspection on this short mission. Our impression is that in these areas at least the Company’s own environment staff are beginning to make their voices heard even if remedial action tends to be slow. For example, sedimentation in waterways---particularly the Nam Kathang---has been a concern for over a year. Experimentation with flocculation has only recently begun. First results are promising---we detected little turbidity in the outlet from the Access Adit, which has posed problems in the past.

The POE recommends that:

- 12. The success in reducing turbidity through flocculation be followed up fast in the many sedimentation ponds around the project.**

Some of the sedimentation problems appeared to emanate from spoil disposal areas---along the downstream channel, for example.

The POE recommends that:

- 13. The sooner the rehabilitation of spoil disposal areas is undertaken the sooner the areas will consolidate, so this work should not be postponed unduly. The CA calls for spoil disposal area plans---these should be submitted for approval with dispatch.**

3. NT2 RESERVOIR RESETTLEMENT

3.1 Introduction

Not only have transitional resettlement activities and accomplishments improved significantly since the publication of the POE's February 2006 report, but improved working relations between Nakai District, GOL's Resettlement Management Unit and NTPC's Resettlement Office are apparent. To avoid risks of backwater effects from the coffer dam during the 2006 rainy season, villagers from six of the seven settlements in Village Group 1 (VG1) living along the Nam Theun have built substantial temporary housing and planted household vegetable gardens on their new resettlement plots following removal of UXOs.¹ Transitional resettlement activities have also begun for the two VG2 villages that were located further up the Nam Theun. By the end of July nearly all Ban Done households had moved to their new plots and approximately 20 of Khone Khen's 52 households. At that time 507 households with approximately 2,530 people had moved into transitional housing. Each house was provided with waterproof roofing and each village with a pumped water supply, a functional school and nursery, and a project office that included district community development staff. A state-of-the-art health program including rice and protein rations based on family size has been well-implemented and paid employment during land clearance and construction activities have provided resettlers with a better diet and income than the majority have been accustomed to. Construction of permanent housing was underway in some villages although problems in acquiring and milling timber were expected to cause completion delays of three to six months for approximately 300 households.

The major casualty of the need to physically resettle the residents of nine villages to avoid possible flooding due to coffer dam construction has been implementation of the livelihood program. As of August 7 2006 approximately two thirds of resettled households have planted vegetable gardens on their permanent household plots. In only Keng Gnao, however, which is the smallest village with eight households, did resettlement occur at an early enough date during the dry season for all households to clear and plant in rice their allotted fields. Approximately 70 percent of fields were cleared and planted in two other villages, but none had been planted in the four remaining villages in VG1 because of resettlement at a later date. While the same has been the case with Ban Done and Khone Khen, most households there have adapted to the situation by cultivating their old fields which remain within walking distance and, fortunately, have not been cut off by the coffer dam's backwater effect. As for sideline activities only about 10 percent of households have built mushroom houses.

¹ For the situation in the seventh (Sop Hia) see below under Vietic Issue.

3.2 Restoring the Balance between New Village Infrastructure and Livelihood Development.

The POE agrees with the June 27, 2006 comments of the NT2 Resettlement Adviser that livelihood development in all resettled villages requires immediate acceleration. At a minimum, all resettled households must be able to cultivate the full extent of their allotted fields during the 2007 rainy season. As more household vegetable gardens, mushroom houses and other sidelines are developed, more attention must be paid to produce marketing. Planning for the future reservoir fishery must be accelerated for it is already behind schedule based on experience elsewhere. The fishery will be an especially important source of income for villagers in the northernmost resettlement area where land for agriculture and livestock management is restricted.

The POE recommends that:

- 14. Henceforth increasing priority be given to livelihood activities, including crop agriculture, livestock management, fisheries and off-farm employment activities, in the already resettled villages.**

3.3 Sorting out Conflicting Advice from NTPC's Livelihood Advisers

NTPC has recruited excellent advisers dealing with gender, Nakai Plateau, Project Lands and XBF livelihood activities, and Nakai Plateau resettlement. As is to be expected with such experts, the POE has already observed that major differences in opinion have emerged, especially in regard to the nature of livelihood activities for resettlers on the Nakai Plateau. Because such differences in opinion threaten planning and implementation of these activities, they must be sorted out to the satisfaction of management as soon as possible. Advisers who are unwilling to accept whatever activity compromises are required should, at the very least, be assigned other responsibilities.

The POE recommends that:

- 15. NTPC management convene for all social advisers at the earliest possible date a workshop or workshops whose function is to thrash out differences of opinion to management's satisfaction.**

3.4 Immigrant Households, Population Pressure on Natural Resources, and Family Planning.

During meetings with GOL officials, a recurring issue was what to do about 30 plus recent immigrant households to resettler villages. Government's natural reaction has been to incorporate them somehow as beneficiaries. The POE believes incorporation to be a major mistake. The main reason is because of the Nakai Plateau's limited natural resource base. Not only have Plateau residents given up

45,000 hectares of better arable soils and grazing for a 20,000 hectare resettlement area of significantly less fertile soils, but pressure on that resettlement area's natural resource base has been increasing for several reasons.

The “ second generation problem” already is apparent. In the Pilot Village, for example, new marriages involving children have already occurred, with up to three families now living in a single house or a new house being built for a married child on a plot meant for one household. Increased pressure on limited arable land resources can be anticipated, especially in the northernmost resettlement zone where consolidation of five villages into one area and road construction have significantly reduced the availability of arable land.

Furthermore, government decisions have increased the number of households in that zone by incorporating immigrant families that came before the NT2 project cut-off date. One example relates to Nong Boua Kham which houses households that came to the Plateau as workers for an enterprise to raise cattle for the military. Another relates to a recent decision to allow immigrant households that came to Sop Hia and Nam Nian during the 1990s to resettle in new Sop Hia after their preferred return to a NT2 project implemented irrigation project in Bolikhamsay Province's Kamkeut District ceased to be a viable option.

The POE's point is not to disagree with those decisions, but rather to show how they have intensified pressure on an already restricted resettlement zone parts of which may already have exceeded their carrying capacity unless all major livelihood activities of the Resettlement Action Plan are well-implemented. Even then the situation for the second generation is going to be tight. For that reason the POE believes that a well implemented family planning program at the village level should be a government priority.

In four different villages the POE asked recently married young women how many children they wished to have. In only one case was five mentioned as opposed to a preference for two to four children. Without exception the availability in the village of injections every three months was the women's preferred family planning method. That being the case, the type of family planning approach that the POE recommends would include, for example, a mobile clinic that would make pre-announced visits to all villages with family planning information and means.

The POE is not sufficiently aware of the situation among the 30 or so households that have already joined resettler villages to suggest how the government should respond to them. That said, the POE urges government authorities not to allow further households to immigrate to resettler villages as opposed to allowing incoming individuals such as widows and other vulnerable individuals to join relatives in an existing household.

The POE recommends that:

- 16. No further “unauthorized households” as opposed to vulnerable individuals be authorized to join resettler villages on the Nakai Plateau.**
- 17. Government family planning services be more carefully tailored to meet the existing and presumably growing demand at the village level among younger women for smaller families.**

3.5 The Vietic Issue

The POE commends recent government decisions to allow Vietic villagers on the Nakai Plateau the option of forming their own resettlement village and to give Vietic households in the PIZ the option of returning to the NPA. Where the problem lies is in NTPC and GOL failure to complete the necessary consultation in a timely fashion. Part of the problem lies in NTPC’s delayed recruitment of an ethnic adviser. One result of that omission was that as late as June 2006 the Resettlement Office apparently was unaware of the fact that non-Vietic households not only had been resettled in what was supposed to be a Vietic Village (8A), but by that time were the large majority. As for the PIZ Vietic households, it was the yet-to-be-implemented responsibility of the WMPA to complete a survey of the affected Vietic households by March 2006 to be followed by a procedure for seeking their informed consent to available options by the end of this year.

The POE recommends that:

- 18. Because the above situation and further delays are unacceptable, the World Bank recruit an ethnic specialist no later than October 2006 to carry out the necessary consultations and to make recommendations based on those consultations as to the siting of a Vietic village on the Nakai Plateau if so desired by Vietic households and procedures for enabling those Vietic households who so desire to return to the NPA.**

3.6 Nakai Plateau Village Forestry Association, House Construction, Salvage Logging and Reservoir Clearance

The forestry aspects of the project are not progressing well. Sawn timber supplies from the Village Forestry Association (VFA) have not kept up with the requirements of the resettlement program so 3-6 months’ delay in the provision of permanent housing in some villages will result. Inadequate planning had been undertaken to build forest management capacity at the village level so a senior MAF forester, employed by the NTPC, is running the VFA until December 2008. The NTPC is effectively in charge of the day-to-day finances of the Association while its overall direction is in the hands of an appointed Management Board.

It will be several years before the contribution from their forest lands will add up to the intended substantial addition to the villagers' income. There will be some employment opportunities once the new VFA sawmill starts operations in September/October 2006. NTPC will eventually pay a fee for the wood from the Plateau (\$300,000 to \$400,000 over a two year period). There is potential for the resettlers to be employed in the harvesting of logs and NTFPs from the reservoir area but arrangements to achieve this remain to be put in place.

This state of affairs is an unfortunate precedent: in effect management of one of their major resources has been taken out of the hands of the villagers for a couple of years at least and their income will suffer. This may be depicted as "adaptive management" but POE sees it as a capacity building failure. The immediate objective must be to head off a fall in resettler morale---already affected to a degree by the unforeseen need for some villages to move into temporary housing before they are permanently housed.

The POE recommends that:

- 19. NTPC and the VFA General Manager give priority to building up the supply of VFA sawn timber for resettlement housing, using non-VFA sawmills in the meantime and accelerating the process of bringing the new VFA mill into production as soon as possible.**
- 20. Planning begin now to build up management expertise in the VFA (with understudies appointed to work alongside the experienced General Manager) so that the villagers may resume control of their forest resources on schedule in December 2008.**
- 21. Maximum use be made of the opportunities over the next two years for the resettlers to obtain employment, build up harvesting and processing and forest management expertise, and add to their income through participation in the drives to produce housing timber and clear the reservoir.**

There has been little forward movement on logging and wider clearance of the extensive area to be inundated once the dam is built. The tendering process for the logging operation broke down and now one firm is to undertake the felling of the logs over the next two dry seasons, while a log tendering process open to all Lao timber companies will be conducted to remove the logs.

Logging and wider clearance of the reservoir are two of the time-bound aspects of the project on which early decisions and action must be taken. The focus at this stage tends to be on removal of the valuable logs, but at least as important in the longer term is resolution of the issue of how much of the smaller diameter timber and other bio-mass should desirably be processed, burned or removed before inundation. Getting the right answer to this question will affect the chemistry and hence water quality of the reservoir for years to come, impacting on drawdown

agriculture, wildlife, the reservoir fishery and tourism ventures. Below the powerhouse, the water quality will impact on river habitat, fisheries, and the utility of river water for human consumption and for irrigation.

The POE recommends that:

- 22. Further advice be sought as a matter of urgency on the inter-relationships between residual bio-mass in the reservoir, water quality and fisheries and hence what quantities of bio-mass should be burned, removed or left intact in the period before inundation.**

Expertise will be called for on limnology, bio-mass chemistry and fishery impacts of inundation of a shallow reservoir at about 1,700 feet altitude in the hot/wet tropics. The subject of production of greenhouse gases may also merit revisiting.

The mechanics of clearing the small-diameter timber and other vegetation including the extensive stands of bamboo, for example, along the river banks has been neglected. While MAF clearly has responsibility for oversight of the logging operation and has set up a Salvage Logging Committee to handle this, there is much less clarity over which Lao agency should oversee the wider reservoir clearance operation once the bio-mass issue has been settled. STEA's EMU has a scientific monitoring role but no operational mandate. The District and perhaps Provincial authorities will have to be involved--and NTPC itself cannot be indifferent to the matter.

The POE recommends that:

- 23. There be an explicit assignment by GOL of direct responsibility for reservoir clearance (beyond the logging operations) to a GOL agency or agencies with the necessary competences, powers and resources.**

3.7 The Reservoir Fishery

In the RAP the reservoir fishery, like the Nakai Plateau Village Forestry Association, is intended to provide a major source of employment and income to resettler households. Experience elsewhere is that the necessary planning should start well before reservoir formation. Institutional structures and individual responsibilities need to be established. Development strategies relating, for example, to introduction of exotic species, acceptable and unacceptable fishing techniques, type of boats to be used, processing and marketing facilities, and conservation procedures need be agreed upon early on if the expected initial increase in fishery productivity is to be captured. Yet in the NT2 case not only has none of the above occurred, but other issues relating, for example, to the relationship of salvage logging to the fishery, remain unresolved. Moreover radically different strategies are being suggested with inadequate understanding of

their potential impact. One example relates to early introduction of exotic species, including their possible use in cage aquaculture, contrary to the global experience that the possibility of such introductions be postponed until after a new reservoir like this has stabilized and the productivity of the indigenous fishery assessed.

While emphasizing the importance of getting on with fishery planning and development, the POE is hesitant to make recommendations because of the uncertainties involved due to the upland situation of the NT2 reservoir, its shallow nature and extensive drawdown area, and unresolved issues concerning salvage logging. As with the need to recruit an ethnic adviser to deal with the Vietic issue, one approach would be to obtain, with prompt donor funding, a short-term senior adviser with global experience with reservoir fisheries, including its relationship to salvage logging, who can work with NTPC and GOL fishery and forest experts.

3.8 Health and Safety Programs

The NTPC's health programs are beginning to make a difference to the quality of life across the project area---and seem likely to be making a much bigger impact within a year or two. The scale and comprehensiveness of the project's regional and resettlement public health programs are unprecedented. This is an all-embracing health service delivery exercise taking in upgrading of existing health centres and Provincial and District hospitals, improved referral and emergency services, public health education and awareness raising work and extensive capacity building. The fact that it is intended to cover around 200 villages downstream as well as the resettlement areas is commendable. It is a most impressive program.

There is a demonstrable need for the overall program and for the upgraded facilities at village, District and Provincial level. The overall infant mortality figures in the project area are high even by world standards, life expectancy rates are low and the parasite load is high in areas not yet reached by regular de-worming campaigns.

The POE visited the refurbished Nakai District Hospital and spoke to staff. The renovation has made the building more attractive and easier to keep clean. They had taken delivery of a sturdy ambulance the day before. Some laboratory equipment has arrived but they await additional medical equipment---unfortunately not due for delivery until 2007. The capacity to perform even relatively simple operations is limited. Supplies of the basic drugs are to hand and, staff reported, are kept up to date.

The pilot village (Nongboua) health program has shown the sort of positive results which bodes well for the future of the wider programs. After four years of regular health checks, good housing, water supply and hygiene and sanitation improvements, and almost total use of impregnated mosquito bed nets in the village, malaria is virtually eradicated and parasitic loads have come down impressively from the 2001 figures. Multiple parasite loads dropped between 2001 and 2005 from 41% to 13% while the incidence of *Ascaris* dropped from 81% to

42% and of Ascaris and Anyhlostoma from 93% to 6%. Malnutrition of the under fives remains a problem because of inadequate feeding to supplement and follow breast feeding, though it has dropped from 29% in 2001 to 18% in 2005 with no cases in 2005 of secondary degree malnutrition.

The POE recommends that:

- 24. NTPC's nutrition and agricultural /horticultural specialists seek affordable solutions to the nutrition gap among the under fives in particular.**

3.9 Family planning

There is an emerging problem here. It can be confidently expected that as a result of the project's health improvement measures child mortality rates will drop significantly and the health of the general population improve markedly in the years to come. That is a welcome development. The only downside is, as noted elsewhere, that as survival rates climb the available land in and around the resettlement areas, for example, will not suffice to carry the burgeoning human population. In the light of the above we were somewhat surprised to hear one health professional say that they were "not pushing" family planning. There is some cultural sensitivity on the subject---but more it seems in the health hierarchy than among village women themselves.

The POE recommends that:

- 25. Health planners be made aware of the sustainability issues surrounding expanding birth/survival rates and move to be more proactive in making contraception and sterilization options---where sought---more freely accessible to male and female villagers. All health clinic and mobile clinic workers should be trained in family planning techniques and District Hospitals as well as Provincial Hospitals should have a sterilization capacity.**

Motivation of health workers appears to be a concern. Low public health salaries are one factor and this is linked to conflicts of interest with private practices, for example, being run by senior medical staff alongside District Hospitals at which they are employed. There is clearly much to be done here to achieve a sustainable health system. The POE is nevertheless greatly impressed by NTPC's commitment to the health aspects of the project and believes that it will eventually stand as an example to other projects elsewhere in Laos and beyond.

3.10 Safety program

Here again the Company may be commended for its commitment to reducing accidents on the project. A vigorous safety program, well staffed and equipped, is in place and is well led. Management at all levels is engaged in trying to reduce the incidence of injuries and deaths and there are trained safety engineers and medical

staff on all major sites. There are safety talks to staff, emergency drills and first-aid training sessions.

That all of this pro-activity is necessary is illustrated by the accident and fatality figures since the project got underway: there have been over a hundred accidents and seven deaths thus far. Most of the accidents have been vehicle-related. The state of the roads, the large number of trucks on the move, the terrain and weather and the pressure to keep up to schedule all contribute to the high proportion of traffic accidents. On our observation there remain also a small number of rogue drivers who need to be retrained or removed. But overall the program is impressive and the record compares favourably with those on similar projects though the seven fatalities are most unfortunate.

4 THE XE BANG FAI BASIN

4.1 Introduction

218 villages in the Xe Bang Fai basin will be affected by the Nam Theun 2 Project. That is four times the combined number that will be affected in the NPA and on the Nakai Plateau. The number of people involved is one of two reasons for the POE's ongoing interest in the social and environmental impacts of the project on that region. The second reason is that the current focus on the XBF basin due to the implementation of NT2 provides GOL with an opportunity to plan and implement an integrated river basin development program that could serve as a pilot project for other river basins in the country. That opportunity depends not just on GOL initiatives, but also on the combined efforts of NTPC, the donors and other interested agencies. As explained in our February 2006 report, the POE sees this opportunity slipping away.

The POE recommends that:

- 26. The Government of Laos request UNDP and the World Bank to convene a Round Table meeting of prospective donors and other relevant agencies to discuss how best to proceed with a well coordinated and funded Xe Bang Fai basin initiative.**

4.2 NTPC's Downstream Restoration Program, Phase 1

The POE is impressed with the Consultants' July 2006 four volumes on the first phase of this program. The goal is to initiate a well-thought out Livelihood and Asset Restoration Program in 21 pilot villages which is complemented by a range of other activities such as upgrading and improving the maintenance of water gates in levees along the more populated lower XBF, initiating a village fisheries co-management program, and reducing flow fluctuation by designing a detention pond along the lower reaches of the 27 km channel.

As emphasized in our third recommendation, the POE is very concerned about NTPC delays in setting up the institutional structure for implementing the Downstream Restoration Program. The POE is also concerned about how possible NTPC decisions could also adversely affect implementation of the following two components of the program.

4.3 Downstream Flow Fluctuations

The possible ramifications of the move to a peaking regime, thus adding substantially to fluctuations in flow down the Nam Phit and the Xe Bang Fai, are not yet fully apparent. The POE was interested last January in the idea of a new reregulating weir being built on the Nam Phit, the object being to help divert waters to adjacent lands and thus absorb some of the so-called surge problem

expected to be generated by the weekly shut down of the turbines. It seems that this idea may now have been shelved. At least three reasons were advanced for this apparent decision, the first being that the “surge” may now be less evident than expected because of the “storage effect” of the downstream channel. The second reason advanced was that there were unspecified technical difficulties with the concept and the third was that funds available for the weir were being reassigned.

The POE recommends that:

- 27. The pending hydrology report on downstream flow fluctuations and related issues being prepared by the NTPC’s Daniel Gunaratnam be fast-tracked and made available for public debate as soon as possible to clear up the uncertainties.**

This is one of several time-bound matters on which early decisions are called for, another being the feasibility under a peaking regime of some of the Gnommalat gravity flow irrigation schemes which have been in planning for several years.

4.4 Gnommalat District Gravity Flow Irrigation

Until recently, it was assumed that NT2 Project impacts on the Gnommalat Community Irrigation Project that will be bisected by the 27 km downstream channel could be offset by providing channel outlets for gravity flow irrigation during the dry season. That assumption is now questionable. According to the June 2006 Resettlement Action Plan (RAP) 3, “In order to apply a gravity concept, the Channel would have to operate at a capacity of 200 m³/sec. The dispatch planning with EGAT shows, however, that particularly during the dry season EGAT will have the lowest dispatch requirement unlike in Thailand, where agreements force EGAT to use the dam capacity for providing water for irrigation purposes to Thai farmers. The flow of water in the Downstream Channel is therefore quite unpredictable and will make any planning for irrigation difficult and unreliable” (page 74).

If the above quote is correct (and the POE has no reason to question it), the uncertainty involved constitutes a serious setback for the NT2 Downstream Restoration Program unless an alternate and reliable source of water is available elsewhere in Gnommalat District for gravity flow irrigation. According to NTEC’s Project Lands manager, there are two possible alternatives. One would route high quality water from where the Nam Gnom exits the Karst formations across the downstream channel for dry season irrigation of approximately 500 hectares. The other would require the dry season release from the regulating pond of the 15 m³/sec stipulated in the Concession Agreement for gravity flow irrigation along the Nam Kathang.

Because of the magnitude of project impacts on the Gnommalat plain where 189 households lose over 50 percent of their livelihood and 404 over 10 percent, the

POE believes that NTPC is obligated to take the lead now in carrying out whatever feasibility studies are needed to determine the most reliable of the three options and then in the planning and implementation of that option. Prompt action is needed because, if, for example, agreement was reached with EGAT to release down the channel 200 m³/sec during the dry season, siting and construction of outlets would have to be finished before channel construction was completed in 2007.

The POE recommends that:

- 28. NTPC promptly take the lead in determining the most reliable option for gravity flow irrigation in Gnommalat District and in the planning and implementation of that option.**

5. THE WMPA AND THE NPA

5.1 The WMPA - Watershed Management and Protection Authority (WMPA)

The POE notes with pleasure that the WMPA appears to be making real progress across its many responsibilities.

Watershed Access Strategy.

Worldwide experience has shown that uncontrolled access is the greatest threat to the integrity of protected areas. At the same time improved access is important for the benefit of villagers in the area. Therefore the development of a Watershed Access Strategy is one of the most important initial tasks of the WMPA.

The POE recommends that:

- 29. WMPA continue development of the Watershed Access Strategy. The Strategy must be set within the framework provided by the Concession Agreement (CA) and the SEMFOP, and must involve meaningful and effective consultation with the villagers.**

Capacity Building

The POE considers that the WMPA Technical Assistants (TAs) are outstanding and when their term is completed it is most important that there be well qualified Lao experts to continue their work. We have noted with concern that at present there is no Lao biologist who could continue the outstanding work of Bill Robichaud. This is particularly important because the area's biodiversity is one of the major reasons for the worldwide interest in and support of the NT2.

The POE recommends that:

- 30. WMPA ensure that there are Lao counterparts to take over when the TAs' terms are completed; and that WMPA act on Dr. Robichaud's proposal that two or more Lao biologists undertake their Ph.D. research in the NT2 area to be mentored by him, with the agreement that they would continue his work after he leaves.**

5.2 World Heritage Status

The POE and IAG have consistently recommended that GOL apply for World Heritage status for the NPA. While this status could materially assist with the protection of the area and the development of Laos' tourism, in the past there was not an adequate organization to protect and manage the area so it was not truly eligible. Now with the welcome development of the WMPA the institutional arrangements are in place.

The POE recommends that:

- 31. GOL pull together the necessary research, assemble an authoritative presentation and apply for World Heritage status for the NPA without further delay, drawing inter alia on the expertise in the WMPA Secretariat.**

5.3 Wildlife Exploitation and Cross-Border Wildlife Trade

Cross-border wildlife trade is not strictly a WMPA issue but it is of direct concern to the POE for several reasons. For ten years the POE has received consistent reports of wildlife being carried illegally over the Vietnam border at the Route 8 border crossing. Within the past month (July 2006) alone, several independent observers have reported large volumes of wildlife passing that way with estimates running as high as a ton of illegal pangolins a day. Once past the Lao border the pangolins and other animals are carried by Lao through the edge of the NPA, around the Vietnam border post.

While some animals come from other areas, many must come from the adjacent NPA. The impact of this depletion of watershed wildlife is devastating. Earlier this year the first photo-trap monitoring of catchment wildlife took place in the area adjacent to Route 8 and the Vietnamese border. The photos obtained from 2,000 trap nights showed no evidence of large wildlife remaining in the area.

Some of these animals, particularly pangolins, may come from other countries with the traders using Laos as a conduit to Vietnam and China. It was reported to us that pangolins receive purportedly legal papers in Laos allowing them to cross the Lao border. We understand that Lao law allows this, although Laos is a party to the CITES Convention that bars any trade in pangolins. If Lao law does indeed allow this trade Laos would appear not to be fulfilling its obligations under the international Convention.

The POE recommends that:

- 32. GOL develop and exert substantially more effective control over illegal wildlife exploitation, and that it ensure that Lao legislation and actions are consistent with the requirements of the CITES Convention.**

5.4 Livelihood Development

Not having the opportunity on this short mission to visit watershed villages the POE limits its comments on livelihood development to what it heard when it sat in on a consultation in Nakai with the representatives of 26 watershed and peripheral impact zone (PIZ) villages. Some imbalance in spending between conservation and development in favor of the latter was noted in POE's last report. So long as this leads to less pressure on harvesting of NTFPs and wildlife this trend may be

justifiable in the short term. The success thus far in the land use zoning, land allocation and livelihood development exercises in the pilot villages of Ban Navang and Ban Kajing is to be extended in the year ahead. The plan is for the work to take in two more village clusters over this period. This is ambitious but so long as the livelihood team can be kept together is achievable.

The POE would advocate investing further resources in the PICAD work--- integrating conservation and development programs so that they are mutually reinforcing and sustainable. This important aspect of WMPA's agenda seems to be evolving relatively slowly though some progress is being made in cultivating plant species which would otherwise be culled from the wild. Research on earlier experiments in the watershed and on cutting edge development programs elsewhere in Laos is called for so that lessons learned may be incorporated in the WMPA program. But overall the livelihood work is progressing well.

6. MACRO-ECONOMIC IMPACTS OF THE NT2 PROJECT

During the POE's August 2006 visit, GOL, NTPC and donor officials mentioned what they believed to be significant direct and indirect impacts of the ongoing construction of the NT2 Project. Based on those impressions as well as the POE's, we believe that a strong case can be made now for initiating the type of macro-economic impact studies that were carried out in connection with Southern Africa's Lesotho Highlands Water Project (LHWP) which, like NT2, was a large-scale project that was expected to have major local, regional and national impacts on a small country.

The POE sought the advice of the World Bank's current project manager for the Lesotho project who in turn sought the advice of economist Stephan Klassen whose familiarity with the economics of LHWP extended over a lengthy time period and who posed two questions concerning the NT2 Project. The first was whether a pre-project study had been carried out anticipating macro and micro impacts. The second was whether or not the NT2 project is "big enough relative to the national economy."

The POE believes the answer to both questions is "yes." Louis Berger International submitted to the government a two volume *Economic Impact Study of Nam Theun 2 Dam Project* in July, 1997. In their overall economic assessment, the authors saw the NT2 project as a potential model for reform: "The project, in addition to yielding substantial economic benefits for the Lao PDR is intended to demonstrate that private investments can and will meet international standards" (Vol 1, page 55). Not only is that the case, but NT2 has already played a major role in attracting other international investors.

As for the way forward, Klassen's suggestion, if answers to the two questions were positive, is that "then some model-based assessment could be undertaken probably using 2006 as the sample year...In any case, it would be critical to have a continuous monitoring in a database of the micro impacts including at least: employment by nationality, skill, pay, and whether they are from the project affected area or not; contracting, subcontracting and supply opportunities by type of works and value going to Laotian companies ... One should also assess the fiscal impact (tax revenues, customs revenues, co-financing, etc)."

The POE recommends that:

- 33. GOL requests World Bank assistance in undertaking the necessary micro and macro economic studies.**

7. CONTINUING ACTIVITIES OF THE PANEL

The Panel anticipates the following activities in the coming year:

- The next dry-season three week visit of the Panel to Lao PDR in January 2007.
- Continuing desk review of revised and updated studies, plans or other documents as requested.
- Consultations and/or presentations with GOL, World Bank and Asian Development Bank staff, NGOs and others as required.

ANNEX: ABBREVIATIONS, ACRONYMS AND GLOSSARY

ADB	Asian Development Bank
AFD	French International Development Agency
Ban	Village
BPKP	Bolisat Phathana Khet Phudoi (Mountainous Region Development Company)
CBD	Convention on Biological Diversity
COD	Commercial Operations Date
Company	Nam Theun 2 Power Company Limited
DAFO	District Agriculture and Forestry Office
DRWG	District Resettlement Working Group
DUDCP	District Upland Development and Conservation Project of the World Bank
EAMP	Environmental Assessment and Management Plan
EMDP	Ethnic Minority Development Plan
EMU	Environmental Monitoring Unit (GOL)
EU	European Union
GIS	Geographic Information System
GOL	Government of Lao P.D.R.
IAG	The International Advisory Group for NT2 of the World Bank
IFIs	International Financial Institutions
IUCN	The World Conservation Union
Lao P.D.R.	The Lao People's Democratic Republic
LIL	Learning and Innovation Loan
IMA	Independent Monitoring Agency
LNCE	Lao National Committee on Energy
MAF	Ministry of Agriculture and Forestry
Nam	River
NBCA	National Biodiversity Conservation Area (protected areas created by GOL Decree)
NGO	Non-governmental Organization
NNT-NBCA	Nakai-Nam Theun National Biodiversity Conservation Area (a portion of the NT2 Project, most of which is in the water catchment area of the project reservoir) which was created in 1993
NPA	National Protected Area, the name now being used for the NNT-NBCA
NT2	Nam Theun 2 Hydro-electric Project
NTFP	Non Timber Forest Products
NTPC	Nam Theun 2 Power Company
Panel, POE	The International Environmental and Social Panel of Experts for the NT2

PICAD	Participatory Integrated Conservation and Development
PIZ	Peripheral Impact Zones
RAP	Resettlement Action Plan
RC	Resettlement Committee
RMU	Resettlement Management Unit
RO	Resettlement Office of the NTPC
SDP	Social Development Plan
SEMFOP-1	Social and Environmental Framework and 1 st Operational Plan for the Watershed Management and Protection Authority
TA	Technical Assistance (position)
TOR	Terms of Reference
UNDP	United Nations Development Programac
UXO	Unexploded Ordnance
VDC	Village Development Committee
VG1	Village Group 1
VG2	Village Group 2
WB	World Bank
WMPA	Watershed Management and Conservation Authority
XBF	Xe Bang Fai