

# Environmental Monitoring Report

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Semi-Annual Report  
July – Dec 2013

## VIE: Renewable Energy Development and Network Expansion and Rehabilitation for Remote Communes Sector Project (A Roang Hydropower Project)

Prepared by Central Power Corporation for the Electricity Vietnam and the Asian  
Development Bank.

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# VIE: Renewable Energy Development and Network Expansion and Rehabilitation for Remote Communes Sector Project (A Roang Hydropower Project)

**REPRESENTATIVE OF CENTRAL POWER CORPORATION  
CENTRAL RURAL ELECTRICITY PROJECT MANAGEMENT BOARD**

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Prepared by Central Power Corporation for the Electricity Vietnam and the Asian Development Bank.

## **CURRENCY EQUIVALENTS**

(as of 30 Dec 2013)

Currency unit	–	Vietnamese Dong (VND)
VND1.00	=	\$0.0000473
\$1.00	=	VND21,125

## **ABBREVIATIONS**

ADB	-	Asian Development Bank
CPC	-	Central Power Corporation
CREB	-	Central Rural Electricity Project Management Board
DONRE	-	Department of Natural Resources and Environment
EMS	-	Environmental Monitoring System
ESDC	-	Environment and Social Development Cell
EVN	-	Electricity Vietnam
IEE	-	Initial Environmental Examination
SONRE	-	Section on Natural Resources and Environment
VIE	-	Viet Nam

## **{WEIGHTS AND MEASURES}**

MW	–	Megawatt
Km	–	Kilometer
km <sup>2</sup>	–	square kilometers
l/s	–	litres per second
m	–	metre
m <sup>3</sup>	–	cubic metre
m <sup>2</sup>	–	square metre
mm	–	millimeter
s	–	seconds
mg/l	–	milligram/litre
dBA	–	{Definition 3}

## **NOTE**

In this report, "\$" refers to US dollars unless otherwise stated.

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## I. INTRODUCTION

### 1. PROJECT INFORMATION

The A Roang hydropower project is a sub-project of Loan 2517-VIE: Renewable Energy Development and Network Expansion and Rehabilitation for Remote Communes Sector Project which is funded by the Asian Development Bank (ADB). The implementing agency of this sub-project is Central Power Corporation (CPC).

The A Roang hydropower plant is constructed for rural electric system in A Roang commune, A Luoi district, Thua Thien Hue province.

#### **Project location**

The whole work items in the project are located within A Roang Commune which is close to the main international Ho Chi Minh Highway 14 and 25 km away from the center of A Luoi district (as well as 70km away from Hue city).

The head-work is located in Ka Rôn village. The pipeline from the headwork runs along Ka Rôn village and finally to the plant which is located nearby the Ka Rôn village with geographic location is: 107° 23' Eastern longitude and 16° 07' Northern latitude. Project location is described in the following figure.

#### **Main work items**

The project is designed to take the waters from the A Lung river which has a small catchment area of only 46 km<sup>2</sup>. The A Lung river is an upstream branch of the A Roang river which in turn feeds into the Bo river.

The project consists of:

- ✓ a concrete gravity dam, cresting approximately 8 m above the riverbed; forming a reservoir of 104,000 cubic metre capacity.
- ✓ an overflow spillway;
- ✓ intake works;
- ✓ a tunnel to pipe water to the penstock;
- ✓ a powerhouse of 7.2 MW in capacity and tailrace.

Water taken from the A Lung River will be delivered to the powerhouse and returned to the river some 1.3 km downstream. The water delivery system is designed to provide a maximum of 4.9 m<sup>3</sup> to two turbines and supply peak power to the national grid system. The reservoir is designed for daily water regulation. The power plant is operated below 17 hours/day in average.

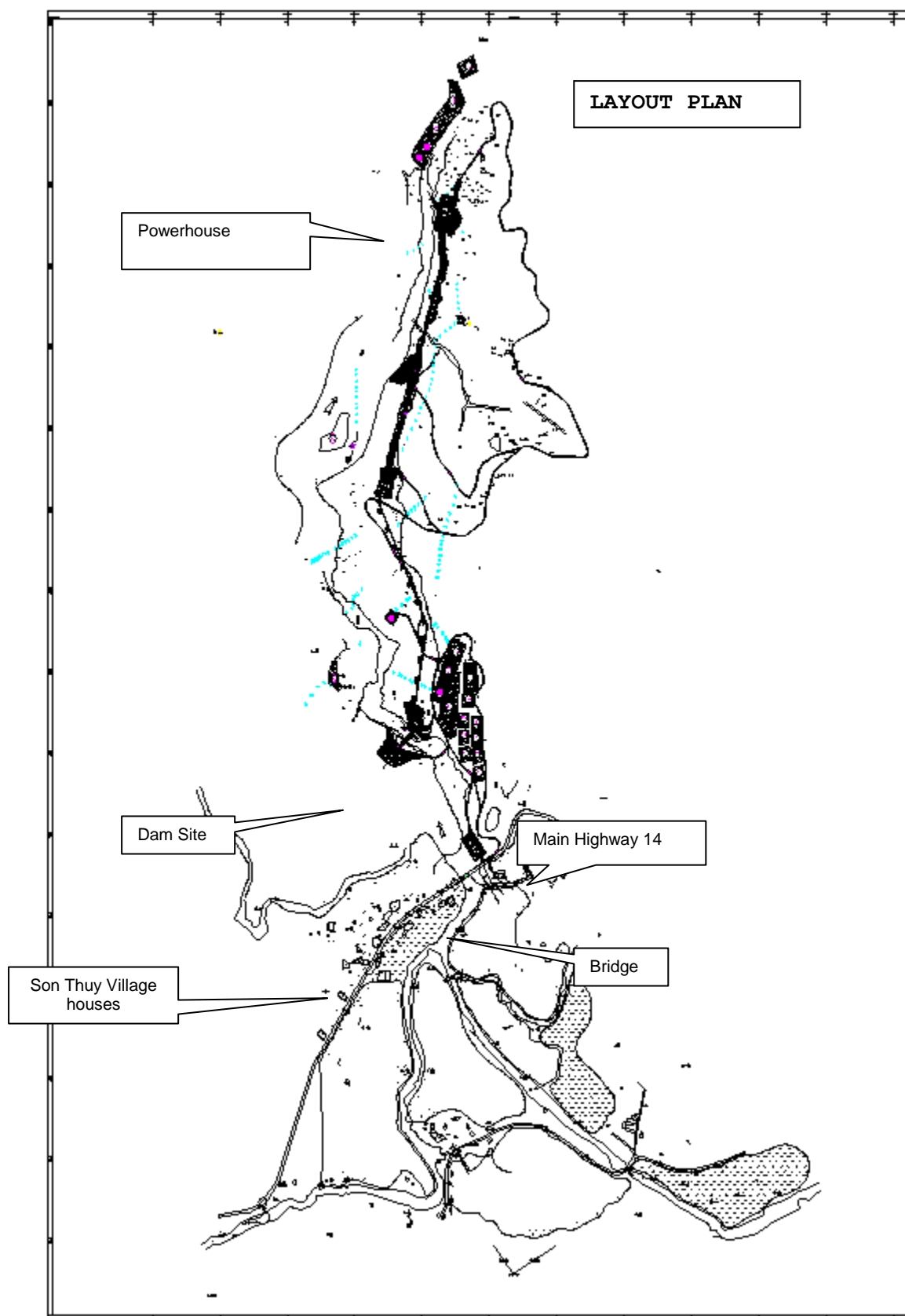


Figure 1. Location of the A Roang Hydropower Project and Components

## 2. PURPOSE OF ENVIRONMENTAL MONITORING

The Central Rural Electricity Project Management Board (CREB) of the Central Power Corporation has been appointed as the department to undertake the management of the implementation of sub-projects of Loan 2517-VIE. The CREB consists of the Hydropower Section, directly monitoring the implementation of A Roang Hydropower project. The CREB is also tasked to establish and assess the environmental performance of the sub-project and its contractors with a view of improving the environmental performance of the overall project.

This Environmental Monitoring Report presents the results of the monitoring of the construction of A Roang hydropower project covering the period July to Dec 2013. The report documents the status of project implementation, compliance with the Environmental Management Plan (EMP), and also compliance with the environmental regulatory requirements of the Government of Vietnam. The report also aims to present corrective or remedial measures for environmental impacts observed during the monitoring period.

The CREB reviewed and monitored the implementation of the EMP based on the Initial Environmental Examination (IEE) report which was submitted to ADB. The Environmental Compliance and Monitoring Form and Environmental Monitoring Checklist provided by ADB was used to assess the compliance of the contractors with the EMP and with ADB's Environment Safeguards. Site visits were carried out to validate implementation of the mitigation measures.

The objectives of the monitoring are:

- ✓ Monitor the sub-project's compliance with Vietnam Technical Regulations and Law on Environment
- ✓ Monitor the sub-project's compliance with ADB's Environment Safeguards requirements
- ✓ Monitor compliance of the contractors with mitigation measures to address construction impacts on the environment as per Contract Conditions and the EMP
- ✓ Determine corrective actions to minimize negative impacts on the environment during the construction phase.

## II. STATUS OF LEGAL & POLICY COMPLIANCE

The Commitment on Environmental Protection (CEP) of A Roang Hydropower project was approved by the People's Committee of A Luoi District on 24 June, 2010. The IEE was also endorsed by ADB. The EMP as contained in the approved IEE was included in the bid document with the contractors. The responsibility of EMP implementation during the construction phase of the project was entrusted to the contractors of the project. The implementation of the EMP by the contractors is being monitored by the field officers of the CREB of CPC.

The A Roang Hydropower Project has secured the following licenses and clearances for its implementation:

**Table 1: Environmental Permits and Licenses Secured**

License/Clearance	License/Clearance No.	Issued by	Date Issued
CEP Approval	07/GXN-UBND	A Luoi District People Committee	24 June 2010
UXO Clearance	-	Van Tuong Co.,Ltd	7 June 2010

There are no other environmental permits and licenses that are pending and needs to be gathered.

## III. ENVIRONMENTAL MANAGEMENT SYSTEM

The Environment and Social Development Cell has not been created by CPC. Instead, a focal person on environmental matters has been appointed within CREB to audit the implementation of the EMP by the contractor and to coordinate activities related to the EMP implementation and monitoring. A monitoring system will be developed and implemented on a regular basis. Documentation of monitoring activities will be retained at the project site by the CREB.

Parties in the EMS and respective responsibilities during construction & operation phases are presented in the table below.

**Table 2: Parties and respective responsibilities in the EMS**

Parties	Responsibilities
CPC/PMU	Manage for ensuring the implementation of the IEE and EMP
Construction Contractor	Implement contents of EMP following to the signed contract
Construction Supervision Consultant	Monitor the implementation of the EMP of the contractor and report to CPC/PMU
Provincial Department of Natural	General management of natural resources and



<b>Parties</b>	<b>Responsibilities</b>
Resources and Environment (DONRE)	environment
District People's Committee	General management of natural resources and environment
Commune People's Committee	General management of natural resources and environment

The following are the personnel assigned by CPC and the contractor to monitor compliance with environmental mitigation measures:

**Table 3: List of contacts/members in EMS**

<b>Name of Personnel</b>	<b>Organization</b>	<b>Responsibilities</b>
Tran Van Tung	Hydropower section of CREB	Monitor of road-stage 2
Doan Van So	Hydropower section of CREB	Monitor of dam
Nguyen Thanh Minh	Hydropower section of CREB	Head of monitor, Monitor of tunnel
Le Huy Hoang	Joint venture between no.564 Construction Co.,Ltd & no.412 Construction Co.,Ltd	Commander, Contractor of road – stage 2
Trinh Xuan Khanh	Joint venture between Song Da no 9.01 JSC & Song Da no 505 JSC	Commander, Contractor of dam
Nguyen Sy Trung	Consulting Construction & Electric power development JSC	Environment Specialist, Contractor of tunnel

### III. WORK PROGRESS

Packages and construction contractors are listed in the table below.

**Table 4: Information on packages and construction contractors**

Construction Package	Description of work item in the package	Name of construction contractor	Contact
No.04-AR	House for administration	Cong Tam .,Ltd Co	Completed
No.12-AR	35kV line from A Roang to Huong Lam	An Ngai JSC	Đinh Thien Vuong
No.10-AR	Stage 1&2 of road	564.,Ltd Co & 412 JSC	Le Huy Hoang
No.19-AR	Head works	Song Da 9.01 & Song Da 505	Trinh Xuan Khanh
No.20-AR	Tunnel	FTD JSC	Nguyen Sy Trung
No.21-AR	Pipeline, plant and substation	No.47 JSC	Truong Van Dang
No.22-AR	35kV line from Bot Do to Huong Lam	An Ngai JSC	Đinh Thien Vuong

The project started construction works of the Stage 2 - access road leading to the powerhouse in November 2012 and Stage 1 – access road from NH11 to the damsite in August 2010. The Stage 1 access road was funded by own budget of CPC.

The access road to the dam and the administration office has been completed. The administration office was completed in May 2012. The construction of the dam, tunnel is ongoing. The dam was started in September 2012 and the tunnel was started in Dec 2012. Table below outlines the progress of the project construction:

**Table 5: Work progress until 30th June, 2013**

Project Component	Time started	Completion	Remarks
Access Road (4km)			
Stage 1	Aug-2010	100%	
Stage 2	Nov-2012	85%	
Administration Office	July-2012	100%	
35kV line: - Huong Lam – A Roang - Bot Do – Huong Lam		95%  0	The remaining part of Huong Lam – A Roang will be continued at the same time as the access road – stage 2

Dam	Sep-2012	30%	
Overflow	Sep-2012	30%	
Diversion channel	Sep-2012	100%	
Intake gate	Sep-2012	80%	
Sand sluicing	Sep-2012	50%	
Valve house	Sep-2012	0%	
Bridge crane		0%	
Pit of Surge tank	Dec-2012	100%	
Concrete of Surge tank	Dec-2012	0%	
Excavation of Tunnel	Dec-2012	67%	
Concrete of Tunnel	Dec-2012	0%	
Tailrace	Dec-2013	0%	
Penstock	Dec-2013	0%	
Powerhouse	Dec-2013	0%	
Tailrace	Dec-2013	0%	
Substation	Dec-2013	0%	

#### IV. ENVIRONMENTAL COMPLIANCE MONITORING

Environmental compliance monitoring is implemented by Construction Supervision Consultant and CREB to check if all construction activities implemented by Construction Contractors follow EMP, IEE and environmental impacts to local areas/local residents during construction.

Table below describes implemented mitigation measures for anticipated impacts from IEE as well as current environmental impacts. Compliance level and Effectiveness of the implemented mitigation measures from Construction Contractors are also assessed.

**Note:**

- *Compliance level and effectiveness level could be ranged from 1 to 5 (1: very good; 2: Good; 3: Fair; 4: Poor; 5: very poor);*
- ***“Compliance level”** refers the actions which had been implemented to see if the actions follow proposed IEE or not. In **“Compliance level”** column, the consultant should decide marks ranged from 1-5; other than that, short passage is necessary to explain why ranking that mark.*
- *Could the impacts be reduced by mitigation measures which had been implemented? How is the impact reduced by that actions/mitigation measures? **“Effectiveness level”** reflects these two question. Short passage is also necessary for explanation in this column.*

Table 6: Assessment of environmental compliance

Impacts & location	Mitigation measures from IEE	Mitigation measures implemented	Compliance level	Effectiveness	Impact observed/ location	More action required & responsibilities	Constructor response
<b>Construction Phase</b>							
Earthworks for new access roads and construction of penstock on steep slopes leading to erosion & encroachment	Slopes along access roads & penstock will be provided with: ✓ Catchments/ cut-off drains, silt traps & chutes to minimize soil erosion. ✓ Masonry retaining structures. ✓ Formation of sediment basins & slope drains.	Contractor built masonry, cut-off drains, silt traps,...	2	2	.There were soil and silt along the canals	Require contractor to regularly maintainance, clean the catchments, silt traps & chutes, masonry retaining structures, sediment basins & slope drains	Contractor agreed
	Maximum usage of material in fill areas.	Yes	1	1		Continue this measure	Contractor agreed
	Spoils planning particularly on steep slopes with bench terracing for high cut areas & avoidance of any erosion and runoff of material on down slopes.	Yes	2	2		Continue this measure	Contractor agreed

Impacts & location	Mitigation measures from IEE	Mitigation measures implemented	Compliance level	Effectiveness	Impact observed/ location	More action required & responsibilities	Constructor response
	Planting grass and revegetation on disturbed areas and maintaining of landscaping.	<ul style="list-style-type: none"> <li>✓ Trees and grasses were planted at slopes of Stage 1 – access road.</li> <li>✓ Grasses are being planted at slopes of dam, stage 2 of road</li> </ul>	1	1	Trees and grasses were planted at slopes of stage 1- access road, slopes of dam,	Require contractor to plant grass and trees of stage 2- road	Contractor agreed to implement when building stage 2- road
Use of Borrow Materials with potential for loss and degradation of land	No earth will be borrowed from cultivable and arable lands. Borrowing to take place from barren, wastelands, & riverbeds. For new borrow areas, all measures will be taken to avoid loss of any productive soil. Any borrow areas will be refilled, re-vegetated & landscaped.	Earth materials were taken only from the site. There were no materials taken from agricultural land.	1	1			
Taking of Quarry Materials with loss and degradation of land	Quarry materials will be obtained from existing operating sites with proper licenses & environmental clearances. New quarries to be opened only with permission of respective authorities.	Existing quarries were used by the contractor.	1	1			
Operation of construction equipment and construction	Fuel storage & refuelling will have adequate containment, away from water bodies/channel.	The storages of waste oil scartter everywhere.	4	4		Storage of waste oil are not collected to right area;  Require contractor to collect waste oil to storage and to right	Contractor agreed

Impacts & location	Mitigation measures from IEE	Mitigation measures implemented	Compliance level	Effectiveness	Impact observed/ location	More action required & responsibilities	Constructor response
activities and contamination of soils, loss of water quality & water pollution						area	
	Equipment will be properly maintained.	The clouts used to clean equipment are not collected	1	1	Equipment has been maintained regularly.	Contractor has to collect clouts used to clean equipment	
	Precautions to be taken to prevent water pollution due to increased siltation & turbidity for weir site & road construction particularly in dry month when flows are low.		2	2			
	Approved sites defined for storage & disposal of wastes materials		2	2		Require contractor to implement	Contractor provided site for waste material in Dec-2012
	Any waste petroleum products will be collected, stored, & disposed of at approved sites.	Waste petroleum has been collected, stored in containments	2	3	The storages of waste petroleum scartter	Require contractor to collect the storage at approved sites	

Impacts & location	Mitigation measures from IEE	Mitigation measures implemented	Compliance level	Effectiveness	Impact observed/ location	More action required & responsibilities	Constructor response
					everywhere		
Construction activities causing disruption of existing surface drains.	Appropriate rain-storm-water channels will be constructed.	Rain-storm water channels were provided at the access road, construction area, stage 2-access road, dam site and administration office.	1	1			
	Provision for cross drainage structures will be made.		2	2			
Construction Camp & Residential colony. Social impacts & pollution from wastewater & solid waste	Construction camps will be located adjoining the dam and powerhouse sites & away from any settlement.	Construction camps are located far from residential communities.	1	1		Continue this measure	Contractor agreed
	Manual labour will be employed locally.	The contractor hired 30-50 workers from the community.	1	1			
	Camps & residential colony will have properly designed sewage treatment system for wastewater effluent. Likewise, solid waste collection system will be employed.	Septic tanks are provided at the camps;  Rain-storm water channels front of camps are blocked	1	1		Continue this measure	Contractor agreed



Impacts & location	Mitigation measures from IEE	Mitigation measures implemented	Compliance level	Effectiveness	Impact observed/ location	More action required & responsibilities	Constructor response
Emission from Construction Vehicles & Equipment causing air pollution	Emission levels of all construction vehicles & equipment will conform to Vietnamese emission standards.	Contractors were required to maintain construction vehicles & equipment regularly.	2	2	The result are in compliance with Vietnamese standard	Require contractor to pay attention to emission	Contractor agreed
	Pollutant parameters will be monitored during construction.	Ambient air quality samplings at the site were conducted on 12 Sep,2013 and on 12 Nov, 2013. Results show compliance with Vietnamese standards.	2	2		Monitor and contractor have to monitor every actions on the site to mitigate the air pollution	Monitor and Contractor agreed
	Crushing, & concrete plants will be away from population centres at dam and powerhouse sites.	Concrete plants are located away from population centers.	1	1		Continue this measure	Contractor agreed
Dust particulates causing health impacts for workers and villagers	All precautions to be taken to reduce dust level emissions from batching plants & portable crushers at dam and powerhouse sites.	The construction site itself is located away from residential community.	1	1			
	Regular water spraying at all mixing sites & temporary service roads will be undertaken.	Water spraying on roads and dusty areas were not being undertaken by the contractor regularly	2	3		Require contractor to implement regularly	Contractor agreed

Impacts & location	Mitigation measures from IEE	Mitigation measures implemented	Compliance level	Effectiveness	Impact observed/ location	More action required & responsibilities	Constructor response
	All delivery vehicles will be covered with tarpaulin.	There were delivery vehicles not covered with tarpaulins.	2	2	Some vehicles were not covered	Require contractor to cover all of delivery vehicles	Contractor agreed
Construction activity Noise from Vehicles, Plant & Equipment causing noise pollution	All construction equipment & plants will conform to Vietnamese noise standards.	Noise sampling was conducted on 12 Sep,2013 and on 12 Nov, 2013. Results show compliance with Vietnamese standards.	1	2			
	All vehicles & equipment to be fitted with noise abatement devices.		2	2			
	Construction workers will be provided with personal protection.	Some construction workers of daml contractor were not wearing personal protection.	2	2	They were not wearing personal protection regularly	Require contractor and workers to wear personal protection regularly	Contractor agreed

Impacts & location	Mitigation measures from IEE	Mitigation measures implemented	Compliance level	Effectiveness	Impact observed/ location	More action required & responsibilities	Constructor response
Noise pollution from any blasting activities at dam and power tunnel and penstock,	Any blasting works will be in accordance with Vietnamese Explosives Act.	There was blasting done on the damsite, intake gate, water channel and surge tank.	1	2	There were blasting works at the damsite, stage 2 - road, tunnel. Contractor paid attention to follow the regulation of blasting	Require contractor to collect the rocks, waste after blasting to the approval site	Contractor agreed
	No blasting between dusk & dawn.		1	1			
	Residents close by will be informed well in advance of blasting times.	Contractor informed residents the blasting times. The blasting works were been in accordance with Vietnamese Explosives Act.	1	1	Contractor informed the time of blasting to residents	Continue this measure	Contractor agreed
	Workers associated with blasting sites will be provided with earplugs, helmets & other personal safety devices.		2	2	Workers didn't wear full of personal protection regularly	Require contractor, workers, monitors to pay attention to wear full of personal protection	Contractor agreed

Impacts & location	Mitigation measures from IEE	Mitigation measures implemented	Compliance level	Effectiveness	Impact observed/ location	More action required & responsibilities	Constructor response
Construction of dam, reservoir, tunnel, penstock with loss of vegetation & tree cover.	No trees to be removed without prior approval.		1	1			
	Compensation for lost trees on private land.	Trees that were removed were compensated.	1	1	Compensated for lost trees on private land		
	Planting grass and maintaining temporary construction areas, roads and other elements of the project.	tree plantation is implemented on the slopes of dam, road	1	1		Trees plantation to be undertaken after construction	
	Indigenous tree species being accorded priority over exotic species such as: <i>Acacia Aurculiformis</i> A.Cunn.ex Benth		2	2			
Work force during construction causing impacts to wildlife	Construction workers to be educated for wildlife conservation with no hunting & poaching to be allowed for workers.	Construction workers are directed not to hunt or poach for wildlife in the area.	1	1	Workers have not hunted or poached	Require workers to continue	Workers agreed to conserve wildlife

Impacts & location	Mitigation measures from IEE	Mitigation measures implemented	Compliance level	Effectiveness	Impact observed/ location	More action required & responsibilities	Constructor response
Construction Activities & Accident Risks	All blasting sites will have warning & clearance signals. Site will be inspected prior/after blasting.	All blasting sites had warning & clearance signals. Site were inspected prior/after blasting.	1	1		Continue this measure	
	Workers will be provided with helmets, masks, safety goggles, etc.	Some workers were not wearing helmets, masks, safety goggles, etc	2	2		Require all of workers to wear personal protection	
	A readily available first aid unit will be available with dressing materials etc.	First-aid kit is available at the administration office.	1	1	There were not first-aid kit at the camps of tunnel contractor	Require to provide the first-aid kit at the camps	Tunnel contractor provided the first-aid kit at the camp on 25 Mar 2013
	Road safety education will be given to construction vehicle drivers.		1	2	All of drivers have license for driving	Require drivers to go slowly and carefully	Contractor agreed
	Traffic management will be ensured during road construction periods.		1	1		Require contractor to manage traffic during road	Contractor agreed to implement
	Information dissemination will take place through the Commune's People Committee regarding activities causing disruption.		1	1			

Impacts & location	Mitigation measures from IEE	Mitigation measures implemented	Compliance level	Effectiveness	Impact observed/ location	More action required & responsibilities	Constructor response
Construction Activities causing disruption to Public Utilities	Any public utilities likely to be impacted, such as water supply pipe system, power/phone lines etc. must be relocated to suitable places, in consultation with local beneficiaries.	Pay attention to mind the power/ phone line of the powerhouse	1	1		Continue this measure	
Any discovery of artifacts or articles of historical interest and importance	For all finds of an historical or cultural value, work will be stopped and the find reported to the nearest office of the Department Culture, Sport and Tourism or the Department of Culture and Information	There were no historical or cultural sites affected by the project.	1	1			
<b>Generated impacts</b>							
None							

## V. PHYSICAL ENVIRONMENT MONITORING

### AIR AND NOISE

Ambient air, noise and surface water sampling works were conducted on: (i) 12th of September 2013; (ii) and 12th of November 2013 by Environmental protection agency of Thua Thien Hue province station of environmental monitoring and analysis.

Air and noise samplings are located at A Roang bridge to assess impact of air, noise by construction activities on local residents and existing workers. Results are analyzed by comparing with Vietnam standard QCVN 05:2009 (for ambient air quality) QCVN 26:2010 (for ambient noise) which are presented in the table below.

**Table 7: Results of Ambient Air Quality Sampling**

Parameter	Sampling Station (A Roang bridge)	QCVN 05:2009	Remarks
<b>Total suspended particulates</b>		<b>300 µg/m<sup>3</sup></b>	
Sep, 2013	190.2 µg/m <sup>3</sup>		Pass
Nov, 2013	173.5 µg/m <sup>3</sup>		Pass
<b>PM<sub>10</sub></b>		<b>150 µg/m<sup>3</sup></b>	
Sep, 2013	48.3 µg/m <sup>3</sup>		Pass
Nov, 2013	42.0 µg/m <sup>3</sup>		Pass

**Table 8: Noise Quality Monitoring**

Parameter	Sampling Station (A Roang bridge)	QCVN 26:2010	Remarks
		55 - 70 dBA	
Sep, 2013	64.7 dBA		Pass
Nov, 2013	62.3 dBA		Pass

The results show that air and noise quality at the A Roang bridge have analyzed values under allowed values given by QCVN 05:2009 and QCVN 26:2010. Construction activities at the time of sampling work did not impact on ambient air and noise quality.

### SURFACE WATER QUALITY

Surface water sampling works were also implemented at the same time in 12<sup>th</sup> Sept. and 12<sup>th</sup> Nov. 2013. Water at A Lung River was sampled for monitoring impacts by construction activities on nearby surface water. The analyzed results are compared with Vietnam standard for surface water quality QCVN 08:2008. Results are presented in the table below.

Table 9: Surface Water Quality

Parameter	Sampling Station 1	Sampling Station 2	Sampling Station 3	QCVN 08:2008				Remarks
				A1	A2	B1	B2	
Fecal coliform (MPN/100ml)				$2.5 \times 10^3$	$2.5 \times 10^3$	$2.5 \times 10^3$	$2.5 \times 10^3$	
Sep, 2013	$1.9 \times 10^3$	$1.0 \times 10^3$	$2.2 \times 10^3$					Pass
Nov, 2013	$1.1 \times 10^3$	$1.7 \times 10^3$	$2.1 \times 10^3$					Pass
Dissolved oxygen (mg/l)				$\geq 6$	$\geq 5$	$\geq 4$	$\geq 2$	
Sep, 2013	6.5	6.7	6.4					Pass
Nov, 2013	6.4	6.6	6.6					Pass
pH				6 - 8.5	6 - 8.5	5.5 - 9	5.5 - 9	
Sep, 2013	6.6	6.7	6.6					Pass
Nov, 2013	6.4	6.5	6.5					Pass
Total suspended particulates				No specified	No specified	No specified	No specified	-
Sep, 2013	0	2	9					
Nov, 2013	0	5	4					
Oil and grease (mg/l)				0.01	0.02	0.1	0.3	
Sep, 2013	>0.3	>0.3	>0.3					Fail
Nov, 2013	>0.3	>0.3	>0.3					Fail
BOD5 (mg/l)				4	6	15	25	
Sep, 2013	4.6	4.0	5.8					Pass
Nov, 2013	4.0	4.4	8.3					Pass



**Notes:**

- ✓ Sampling station 1: Upstream of dam
- ✓ Sampling station 2: Downstream of dam
- ✓ Sampling station 3: Downstream of powerhouse
- ✓ A1: Use for the purpose of supplying the running water and others purposes as: A2, B1, B2
- ✓ A2: Use for the purpose of supplying the running water after treating, preserving the aquatic life and others purposes as: B1, B2
- ✓ B1: Use for the purpose of the irrigation and others purposes as: B2
- ✓ B2: Use for the purpose of the river traffic and other purposes required the low quality water.

The result shows that concentration of oil & grease in A Lung river at all sampling locations exceed maximum allowed value given in the QCVN 08:2008. Degrading water quality by increasing oil & grease in the A Lung river might affect regional under-water lives. This might be resulted from construction activities that need be strictly controlled.

All remaining environmental parameters have sampled values below the maximum allowed following QCVN 08:2008.

## VI. KEY ENVIRONMENTAL ISSUES & ACTIONS

According to the Environmental Assessment and Review Framework (EARF) of this loan, the sub-projects must comply with the government regulations. The sub-project should also not involve activities located in the core zone, or as much as possible, in or near the buffer zone of designated special use forests consisting of national parks, protected landscapes and nature reserves or nature conservation areas and other protected areas where the proposed development is prohibited. The sub-project should as much as possible not involve activities located in or near ecologically sensitive and significant areas as recognized by the Government or any area that is internationally significant. In addition, the sub-project should, as much as possible, not involve activities located in or near any cultural heritage and historical sites designated by the Government or by international agencies such as UNESCO.

The A Roang hydropower project and its components were designed after detailed surveys to ensure strict compliance with the above conditions. The A Roang hydropower project and components are not passing through any wildlife sanctuary or national park. There are no sensitive areas or monuments of cultural and historical importance that is affected by the project activities.

The following are the key issues and follow-up actions that were identified.

- The waste around camp site of contractor
  - ✓ Although there are the approval sites for collecting waste in the camp site, workers often throw out the waste around the camps or brush. The monitors have to remind the contractor to collect the waste to the approval site many times. The commander or the environment specialist of contractors should remind the workers to collect the waste regularly.
- Erosion along the slopes of dam because of heavy rain
  - ✓ These two quarters are in the rainy season. The rain was very heavy and long, so soil runoffs from the slope made the erosion. The contractor was advised to conduct immediate rehabilitation of disturbed areas and to implement soil erosion control methods.
- Problems when done blasting
  - ✓ Now, the blasting is implemented at many areas of the site. So the contractors have to pay attention to follow the regulations of blasting. The contractor informed to residents about the blasting time, provided the warning and clearance signals. But the workers done blasting didn't wear full of personal protection. The monitors, commanders need to check all of conditions before blasting.
- Waste oil and fuel
  - ✓ At some locations. waste oil and fuel are not collected to the storage, they cause pollution. And at some locations, the storages of waste oil and fuel are scattered around the site. The clouts after cleaning equipment are not collected to the right area. Contractors are required to immediately provide the measure to improve.

Table below summarizes the key issues, follow-up actions and the timeframe for implementation:

**Table 10: Environmental issues and follow-up actions required**

<b>Follow-up Actions Required</b>	<b>Timeframe</b>	<b>Responsible Parties</b>	<b>Reporting to</b>
Contractor and workers to observe full of safety when blasting	Immediately	<ul style="list-style-type: none"> <li>✓ Joint venture between No..564 Construction Co.,Ltd &amp; No..412 Construction Co.,Ltd</li> <li>✓ Joint venture between Song Da No. 9.01 JSC &amp; Song Da No. 505 JSC</li> <li>✓ Consulting Construction &amp; Electric power development JSC</li> </ul>	<ul style="list-style-type: none"> <li>✓ Site Construction Supervision Officers</li> <li>✓ CREB</li> </ul>
Clear the rain-storm water around the camp	Immediately	<ul style="list-style-type: none"> <li>✓ Joint venture between No..564 Construction Co.,Ltd &amp; No..412 Construction Co.,Ltd</li> <li>✓ Joint venture between Song Da No. 9.01 JSC &amp; Song Da No. 505 JSC</li> <li>✓ Consulting Construction &amp; Electric power development JSC</li> </ul>	<ul style="list-style-type: none"> <li>✓ Site Construction Supervision Officers</li> <li>✓ CREB</li> </ul>
Collect the storage of waste oil and fuel	Immediately	<ul style="list-style-type: none"> <li>✓ Joint venture between No..564 Construction Co.,Ltd &amp; No..412 Construction Co.,Ltd</li> <li>✓ Joint venture between Song Da No. 9.01 JSC &amp; Song Da No. 505 JSC</li> <li>✓ Consulting Construction &amp; Electric power development JSC</li> </ul>	<ul style="list-style-type: none"> <li>✓ Site Construction Supervision Officers</li> <li>✓ CREB</li> </ul>
Conduct watering the dusty areas	Immediately	<ul style="list-style-type: none"> <li>✓ Joint venture between No..564 Construction Co.,Ltd &amp; No..412 Construction Co.,Ltd</li> </ul>	<ul style="list-style-type: none"> <li>✓ Site Construction Supervision Officers</li> <li>✓ CREB</li> </ul>

## VII. CONCLUSIONS & RECOMMENDATION

As of June 30, 2013, the project has completed the Stage 1 access road and the administration office. The project has accomplished 90% of the 35kV line of Huong Lam – A Roang. The remaining part of Huong Lam – A Roang will be continued simultaneous with the construction of Stage 2 access road. The diversion channel has completed. The dam is ongoing with about 20% accomplishment while Stage 2 access road is about 15% completed, the overflow is about 10%, intake gate 30%, tunnel 15%

In terms of implementation of the environmental management plan, some lapses of the contractor were noted such as:

- ✓ Workers were not full of wearing personal protection when blasting
- ✓ Rain-storm water the camps
- ✓ Erosions at slopes
- ✓ Waste oil and fuel not collected to storage

The contractors were immediately notified about these lapses in the implementation of EMP, to which they immediately agreed to implement.

As of Dec 30, 2013, the contractor implemented the following measures:

- ✓ rehabilitation of slopes
- ✓ bench terracing of spoils on steep slopes
- ✓ provided a site for storage/disposal of waste materials
- ✓ provided septic tanks at the campsite
- ✓ delivery vehicles are now covered with tarpaulin
- ✓ Workers wear personal protection.
- ✓ Collect storage of waste oil and fuel

CREB also conducted ambient air quality, noise and water quality monitoring. Ambient air and noise levels were taken at A Roang bridge which is an area where settlements are located. The site was selected to validate potential impacts of the construction of the project to the community. The levels of total suspended particulates, PM10, and noise show compliance with the Vietnamese standards.

Water quality samples were taken at three (3) sampling points, i.e. upstream of dam, downstream of dam, and downstream of powerhouse. The samples were analyzed for fecal coliform, Dissolved Oxygen (DO), pH, total suspended particulates, oil and grease, and BOD<sub>5</sub>. The laboratory results show that almost the samples are in conformance with the Vietnamese standard.

Based on the results of the monitoring, some of the anticipated environmental impacts during the construction period have been mitigated by implementing the EMP. Proper implementation of the EMP and monitoring mechanism throughout the project life cycle,

supported by strong institutional arrangement has considerably minimized the adverse impacts of the project activities. CREB will continue to monitor the contractor's performance in terms of sustaining the implementation of the EMP.

## **APPENDICES**

- a) Appendix 1: Environmental Compliance and Monitoring Forms covering the period July - Dec 2013
- b) Appendix 2: Environmental Monitoring Checklist covering the period July - Dec 2013
- c) Appendix 3: Copies of permits and clearances secured
- d) Appendix 4: Photographs of the project site
- e) Appendix 5: Test reports

## Appendix 1: Environmental Compliance and Monitoring Forms covering the period July - December 2013

### Environmental Compliance Inspection and Monitoring Form 1

**Project:** Renewable Energy Development and Network Expansion and Rehabilitation For Remote Communes Sector Project

**Implementing Agency:** Central Rural Electric Project Management Board

**Sub-Project** :A Roang Hydropower Plant Project

**Monitoring Agency :** Central Rural Electric Project Management Board

**Location** :A Luoi District, Thua Thien Hue province

**Enforcement Agency:** Central Power Corporation

**Date** :12<sup>th</sup> September 2013

**Contractor(s):** JV between Construction Co., Ltd No.564 and Investment and Construction JSC No.412

**Reporting Period** :Quarterly

**Implementation Phase:** Construction Stage

#### 1. Contractor(s)

Contractor(s) Environmental Awareness	Yes / No	Actions Required	Contractor Response / Comment
Contractor(s) aware of mitigation requirements?	Yes	Request contractor to follow up the mitigation requirement made by Monitoring Agency	Obey the instruction and requirement of Monitoring Agency
Contractor(s) have a copy of EMP?	Yes	Request contractor to be mind of EMP attached with Construction Contract	Obey the instruction and requirement of Monitoring Agency

#### 2. Mitigation Compliance Inspection

Impact / Mitigation Measure (From EMP)	Mitigations Implemented (Yes, No)	Mitigations Effective? (1 to 5)*	Impact Observed / Location	Action Required	Contractor Response / Comment	Endorsed by:	
						Impleme nting Agency	Monitorin g Agency
Slopes along access roads & penstock will be provided with: - Catchments/ cut-off drains, silt traps & chutes to minimize soil	Yes	2	Checking on site				

Impact / Mitigation Measure (From EMP)	Mitigations Implemented (Yes, No)	Mitigations Effective? (1 to 5)*	Impact Observed / Location	Action Required	Contractor Response / Comment	Endorsed by:	
						Impleme nting Agency	Monitorin g Agency
erosion. - Masonry retaining structures. - Formation of sediment basins & slope drains. - Maximum usage of material in fill areas. - Spoils planning particularly on steep slopes with bench terracing for high cut areas & avoidance of any erosion and runoff of material on down slopes - Planting grass and revegetation on disturbed areas and maintaining of landscaping.							
- No earth will be borrowed from cultivable and arable lands. - Borrowing to take place from barren, wastelands, & riverbeds. - For new borrow areas, all measures will be taken to avoid loss of any productive soil. -Any borrow areas will be refilled, re-vegetated & landscaped.	Yes	2	Checking on site				
- Quarry materials will be obtained from existing operating sites with proper licenses & environmental clearances. - New quarries to be opened only with permission of respective authorities.	Yes	1	Checking on site				
- Fuel storage & refuelling will have adequate containment, away from water bodies/channel. Equipment will be properly maintained. - Precautions to be taken to prevent water pollution due to increased siltation & turbidity for weir site & road construction particularly in dry month when flows are low. - Approved sites defined for storage & disposal of wastes materials Any waste petroleum products will be collected, stored, & disposed of at approved sites.	Yes	4	Checking on site				



Impact / Mitigation Measure (From EMP)	Mitigations Implemented (Yes, No)	Mitigations Effective? (1 to 5)*	Impact Observed / Location	Action Required	Contractor Response / Comment	Endorsed by:	
						Impleme nting Agency	Monitorin g Agency
<ul style="list-style-type: none"> <li>- Appropriate rain-storm-water channels will be constructed.</li> <li>- Provision for cross drainage structures will be made.</li> </ul>	Yes	2	Checking on site				
<ul style="list-style-type: none"> <li>- Construction camps will be located adjoining the dam and powerhouse sites &amp; away from any settlement. Manual labour will be employed locally.</li> <li>- Camps &amp; residential colony will have properly designed sewage treatment system for wastewater effluent. Likewise, solid waste collection system will be employed.</li> </ul>	Yes	4	Checking on site	Required to build resting system/ house	Implementa tion fairly slow		
<ul style="list-style-type: none"> <li>- Emission levels of all construction vehicles &amp; equipment will conform to Vietnamese emission standards.</li> <li>- Pollutant parameters will be monitored during construction. Crushing, &amp; concrete plants will be away from population centres at dam and powerhouse sites.</li> </ul>	Yes	3	Checking on site				
<ul style="list-style-type: none"> <li>- All precautions to be taken to reduce dust level emissions from batching plants &amp; portable crushers at dam and powerhouse sites.</li> <li>- Regular water spraying at all mixing sites &amp; temporary service roads will be undertaken.</li> <li>-All delivery vehicles will be covered with tarpaulin.</li> </ul>	Yes	2	Checking on site				
<ul style="list-style-type: none"> <li>- All construction equipment &amp; plants will conform to Vietnamese noise standards.</li> <li>- All vehicles &amp; equipment to be fitted with noise abatement devices.</li> </ul> <p>Construction workers will be provided with personal protection.</p>	Yes	2	Checking on site				
<ul style="list-style-type: none"> <li>- Any blasting works will be in accordance with Vietnamese Explosives Act.</li> <li>- No blasting between dusk &amp; dawn.</li> <li>- Residents close by will be informed well in advance of blasting</li> </ul>	Yes	2					

Impact / Mitigation Measure (From EMP)	Mitigations Implemented (Yes, No)	Mitigations Effective? (1 to 5)*	Impact Observed / Location	Action Required	Contractor Response / Comment	Endorsed by:	
						Impleme nting Agency	Monitorin g Agency
times. Workers associated with blasting sites will be provided with earplugs, helmets & other personal safety devices.							
<ul style="list-style-type: none"> <li>- No trees to be removed without prior approval,</li> <li>- Compensation for lost trees on private land,</li> <li>- Planting grass and maintaining</li> </ul> -Tree plantation implemented at dam area, tunnel, penstock, temporary construction areas, roads and other elements of the project. Indigenous tree species being accorded priority over exotic species such as: <i>Acacia Aurculiformis</i> A.Cunn.ex Benth	Yes	2	Checking on site				
-Construction workers to be educated for wildlife conservation with no hunting & poaching to be allowed for workers.	Yes	1	Checking on site				
<ul style="list-style-type: none"> <li>- All blasting sites will have warning &amp; clearance signals. Site will be inspected prior/after blasting.</li> <li>- Workers will be provided with helmets, masks, safety goggles, etc.</li> <li>- A readily available first aid unit will be available with dressing materials etc.</li> <li>- Road safety education will be given to construction vehicle drivers.</li> <li>- Traffic management will be ensured during road construction periods.</li> </ul> Information dissemination will take place through the Commune's People Committee regarding activities causing disruption.	Yes	2	Checking on site	Required contractor to wear all of personal protection	Response acceptable		
- Any public utilities likely to be impacted, such as water supply pipe system, power/phone lines etc. must be relocated to suitable places, in consultation with local beneficiaries.	Yes	1	Checking on site				
- For all finds of an historical or cultural value, work will be stopped and the find reported to the nearest office of the Department Culture, Sport and Tourism or the Department of Culture and Information	Yes	1	Checking on site				

## Mitigation Effectiveness Rating Criteria (Indicative examples)

1. Very Good (all required mitigations implemented)
2. Good ( the majority of required mitigations implemented)
3. Fair (some mitigations implemented)
4. Poor (few mitigations implemented)
5. Very Poor (very few mitigations implemented)

**3. Environmental Incidents During Reporting Period (if relevant)**

Environmental Incidents (accidents, spills, complaint)	Date / Location	Reported by	Description / Location	Action Taken	Further Action Required	Endorsed by:	
						Implementing Agency	Monitoring Agency
No Incident occurred							

**4. Summary of Actions Required and Follow-up**

Action Required	Timeframe	Responsible Parties	Follow-up (to be completed if inspection/monitoring indicates actions are required)
Wearing full of personal protection when blasting	Immediately	Contractor, Monitoring Agency	<b>Required Action Taken:</b> Contractor has equipped all requirement personal protectional
			<b>Effectiveness:</b> Fairly good
			<b>Further Action Required:</b> N/A
			<b>Prepared by:</b>

**Inspection Completed by:** Central Rural Electric Project Management Board

**Date:** 12<sup>th</sup> Sep 2013

**Signature:** Tran Van Tung

## Environmental Compliance Inspection and Monitoring Form 2

**Project:** Renewable Energy Development and Network Expansion and Rehabilitation For Remote Communes Sector Project

**Implementing Agency:** Central Rural Electric Project Management Board

**Sub-Project** :A Roang Hydropower Plant Project

**Monitoring Agency :** Central Rural Electric Project Management Board

**Location** :A Luoi District, Thua Thien Hue province

**Enforcement Agency:** Central Power Corporation

**Date** :12<sup>th</sup> September 2013

**Contractor(s):** JV between Song Da 9.01JSC and Song Da 505 JSC

**Reporting Period** :Quarterly

**Implementation Phase:** Construction Stage

### 1. Contractor(s)

Contractor(s) Environmental Awareness	Yes / No	Actions Required	Contractor Response / Comment
Contractor(s) aware of mitigation requirements?	Yes	Request contractor to follow up the mitigation requirement made by Monitoring Agency	Obey the instruction and requirement of Monitoring Agency
Contractor(s) have a copy of EMP?	Yes	Request contractor to be mind of EMP attached with Construction Contract	Obey the instruction and requirement of Monitoring Agency

### 2. Mitigation Compliance Inspection

Impact / Mitigation Measure (From EMP)	Mitigations Implemented (Yes, No)	Mitigations Effective? (1 to 5)*	Impact Observed / Location	Action Required	Contractor Response / Comment	Endorsed by:	
						Implementing Agency	Monitoring Agency
Slopes along access roads & penstock will be provided with: - Catchments/ cut-off drains, silt traps & chutes to	Yes	2	Checking on site				

Impact / Mitigation Measure (From EMP)	Mitigations Implemented (Yes, No)	Mitigations Effective? (1 to 5)*	Impact Observed / Location	Action Required	Contractor Response / Comment	Endorsed by:	
						Implementing Agency	Monitoring Agency
minimize soil erosion. - Masonry retaining structures. - Formation of sediment basins & slope drains. - Maximum usage of material in fill areas. - Spoils planning particularly on steep slopes with bench terracing for high cut areas & avoidance of any erosion and runoff of material on down slopes - Planting grass and revegetation on disturbed areas and maintaining of landscaping.							
- No earth will be borrowed from cultivable and arable lands. - Borrowing to take place from barren, wastelands, & riverbeds. - For new borrow areas, all measures will be taken to avoid loss of any productive soil. -Any borrow areas will be refilled, re-vegetated & landscaped.	Yes	2	Checking on site				
- Quarry materials will be obtained from existing operating sites with proper licenses & environmental clearances. - New quarries to be opened only with permission of respective authorities.	Yes	1	Checking on site				
- Fuel storage & refuelling will have adequate containment, away from water bodies/channel. Equipment will be properly maintained. - Precautions to be taken to prevent water pollution due to increased siltation & turbidity for weir site & road construction particularly in dry month when flows are low. - Approved sites defined for storage & disposal of	Yes	2	Checking on site				

Impact / Mitigation Measure (From EMP)	Mitigations Implemented (Yes, No)	Mitigations Effective? (1 to 5)*	Impact Observed / Location	Action Required	Contractor Response / Comment	Endorsed by:	
						Implementing Agency	Monitoring Agency
wastes materials Any waste petroleum products will be collected, stored, & disposed of at approved sites.							
<ul style="list-style-type: none"> <li>- Appropriate rain-storm-water channels will be constructed.</li> <li>- Provision for cross drainage structures will be made.</li> </ul>	Yes	2	Checking on site				
<ul style="list-style-type: none"> <li>- Construction camps will be located adjoining the dam and powerhouse sites &amp; away from any settlement. Manual labour will be employed locally.</li> <li>- Camps &amp; residential colony will have properly designed sewage treatment system for wastewater effluent. Likewise, solid waste collection system will be employed.</li> </ul>	Yes	2	Checking on site				
<ul style="list-style-type: none"> <li>- Emission levels of all construction vehicles &amp; equipment will conform to Vietnamese emission standards.</li> <li>- Pollutant parameters will be monitored during construction.</li> </ul> Crushing, & concrete plants will be away from population centres at dam and powerhouse sites.	Yes	3	Checking on site				
<ul style="list-style-type: none"> <li>- All precautions to be taken to reduce dust level emissions from batching plants &amp; portable crushers at dam and powerhouse sites.</li> <li>- Regular water spraying at all mixing sites &amp; temporary service roads will be undertaken.</li> </ul> -All delivery vehicles will be covered with tarpaulin.	Yes	2	Checking on site				
<ul style="list-style-type: none"> <li>- All construction equipment &amp; plants will conform to Vietnamese noise standards.</li> </ul>	Yes	2	Checking on site				

Impact / Mitigation Measure (From EMP)	Mitigations Implemented (Yes, No)	Mitigations Effective? (1 to 5)*	Impact Observed / Location	Action Required	Contractor Response / Comment	Endorsed by:	
						Implementing Agency	Monitoring Agency
<ul style="list-style-type: none"> <li>- All vehicles &amp; equipment to be fitted with noise abatement devices.</li> </ul> <p>Construction workers will be provided with personal protection.</p>							
<ul style="list-style-type: none"> <li>- Any blasting works will be in accordance with Vietnamese Explosives Act.</li> <li>- No blasting between dusk &amp; dawn.</li> <li>- Residents close by will be informed well in advance of blasting times.</li> </ul> <p>Workers associated with blasting sites will be provided with earplugs, helmets &amp; other personal safety devices.</p>	Yes	1	Checking on site				
<ul style="list-style-type: none"> <li>- No trees to be removed without prior approval,</li> <li>- Compensation for lost trees on private land,</li> <li>- Planting grass and maintaining</li> </ul> <p>-Tree plantation implemented at dam area, tunnel, penstock, temporary construction areas, roads and other elements of the project. Indigenous tree species being accorded priority over exotic species such as: <i>Acacia Aurculiformis</i> A.Cunn.ex Benth</p>	Yes	2	Checking on site				
<p>-Construction workers to be educated for wildlife conservation with no hunting &amp; poaching to be allowed for workers.</p>	Yes	1	Checking on site				
<ul style="list-style-type: none"> <li>- All blasting sites will have warning &amp; clearance signals. Site will be inspected prior/after blasting.</li> <li>- Workers will be provided with helmets, masks, safety goggles, etc.</li> <li>- A readily available first aid unit will be available with dressing materials etc.</li> <li>- Road safety education will be given to construction vehicle drivers.</li> <li>- Traffic management will be ensured during road</li> </ul>	Yes	2	Checking on site				

Impact / Mitigation Measure (From EMP)	Mitigations Implemented (Yes, No)	Mitigations Effective? (1 to 5)*	Impact Observed / Location	Action Required	Contractor Response / Comment	Endorsed by:	
						Implementing Agency	Monitoring Agency
construction periods. Information dissemination will take place through the Commune's People Committee regarding activities causing disruption.							
- Any public utilities likely to be impacted, such as water supply pipe system, power/phone lines etc. must be relocated to suitable places, in consultation with local beneficiaries.	Yes	1	Checking on site				
- For all finds of an historical or cultural value, work will be stopped and the find reported to the nearest office of the Department Culture, Sport and Tourism or the Department of Culture and Information	Yes	1	Checking on site				

Mitigation Effectiveness Rating Criteria (Indicative examples)

6. Very Good (all required mitigations implemented)
7. Good ( the majority of required mitigations implemented)
8. Fair (some mitigations implemented)
9. Poor (few mitigations implemented)
10. Very Poor (very few mitigations implemented)

### 3. Emission Discharge Monitoring (if relevant)

Parameter	Date / Location	Measured by	Monitoring Equipment	Result	Standard	% Exceedence	Action Required	Contractor Responses/ Comments	Endorsed by:	
									Implementing Agency	Monitoring Agency

### 4. Ambient Monitoring (if relevant)



**5. Environmental Incidents During Reporting Period (if relevant)**

Environmental Incidents (accidents, spills, complaint)	Date / Location	Reported by	Description / Location	Action Taken	Further Action Required	Endorsed by:	
						Implementing Agency	Monitoring Agency
No Incident occurred							

**6. Summary of Actions Required and Follow-up (if relevant)**

Action Required	Timeframe	Responsible Parties	Follow-up
			(to be completed if inspection/monitoring indicates actions are required)
Wearing full of personal protection	Immediately	Contractor, Monitoring Agency	<b>Required Action Taken:</b> Contractor has equipped all requirement personal protectional
			<b>Effectiveness:</b> Fairly good
			<b>Further Action Required:</b> N/A

**Inspection Completed by:** Central Rural Electric Project Management Board

**Date:** 12<sup>th</sup> Sep 2013

**Signature:** Doan Van So

### Environmental Compliance Inspection and Monitoring Form 3

**Project:** Renewable Energy Development and Network Expansion and Rehabilitation For Remote Communes Sector Project

**Implementing Agency:** Central Rural Electric Project Management Board

**Sub-Project** :A Roang Hydropower Plant Project

**Monitoring Agency :** Central Rural Electric Project Management Board

**Location** :A Luoi District, Thua Thien Hue province

**Enforcement Agency:** Central Power Corporation

**Date** :12<sup>th</sup> Sep 2013

**Contractor(s):** Consulting Construction & Electric power development JSC

**Reporting Period** :Quarterly

**Implementation Phase:** Construction Stage

#### 7. Contractor(s)

Contractor(s) Environmental Awareness	Yes / No	Actions Required	Contractor Response / Comment
Contractor(s) aware of mitigation requirements?	Yes	Request contractor to follow up the mitigation requirement made by Monitoring Agency	Obey the instruction and requirement of Monitoring Agency
Contractor(s) have a copy of EMP?	Yes	Request contractor to be mind of EMP attached with Construction Contract	Obey the instruction and requirement of Monitoring Agency

#### 8. Mitigation Compliance Inspection

Impact / Mitigation Measure (From EMP)	Mitigations Implemented (Yes, No)	Mitigations Effective? (1 to 5)*	Impact Observed / Location	Action Required	Contractor Response / Comment	Endorsed by:	
						Implementing Agency	Monitoring Agency
Slopes along access roads & penstock will be provided with: - Catchments/ cut-off drains, silt traps & chutes to minimize soil erosion.	Yes	2	Checking on site				

Impact / Mitigation Measure (From EMP)	Mitigations Implemented (Yes, No)	Mitigations Effective? (1 to 5)*	Impact Observed / Location	Action Required	Contractor Response / Comment	Endorsed by:	
						Implementing Agency	Monitoring Agency
<ul style="list-style-type: none"> <li>- Masonry retaining structures.</li> <li>- Formation of sediment basins &amp; slope drains.</li> <li>- Maximum usage of material in fill areas.</li> <li>- Spoils planning particularly on steep slopes with bench terracing for high cut areas &amp; avoidance of any erosion and runoff of material on down slopes</li> <li>- Planting grass and revegetation on disturbed areas and maintaining of landscaping.</li> </ul>							
<ul style="list-style-type: none"> <li>- No earth will be borrowed from cultivable and arable lands.</li> <li>- Borrowing to take place from barren, wastelands, &amp; riverbeds.</li> <li>- For new borrow areas, all measures will be taken to avoid loss of any productive soil.</li> <li>-Any borrow areas will be refilled, re-vegetated &amp; landscaped.</li> </ul>	Yes	2	Checking on site				
<ul style="list-style-type: none"> <li>- Quarry materials will be obtained from existing operating sites with proper licenses &amp; environmental clearances.</li> <li>- New quarries to be opened only with permission of respective authorities.</li> </ul>	Yes	1	Checking on site				
<ul style="list-style-type: none"> <li>- Fuel storage &amp; refuelling will have adequate containment, away from water bodies/channel. Equipment will be properly maintained.</li> <li>- Precautions to be taken to prevent water pollution due to increased siltation &amp; turbidity for weir site &amp; road construction particularly in dry month when flows are low.</li> <li>- Approved sites defined for storage &amp; disposal of wastes materials</li> </ul>	Yes	2	Checking on site				

Impact / Mitigation Measure (From EMP)	Mitigations Implemented (Yes, No)	Mitigations Effective? (1 to 5)*	Impact Observed / Location	Action Required	Contractor Response / Comment	Endorsed by:	
						Implementing Agency	Monitoring Agency
Any waste petroleum products will be collected, stored, & disposed of at approved sites.							
<ul style="list-style-type: none"> <li>- Appropriate rain-storm-water channels will be constructed.</li> <li>- Provision for cross drainage structures will be made.</li> </ul>	Yes	2	Checking on site				
<ul style="list-style-type: none"> <li>- Construction camps will be located adjoining the dam and powerhouse sites &amp; away from any settlement. Manual labour will be employed locally.</li> <li>- Camps &amp; residential colony will have properly designed sewage treatment system for wastewater effluent. Likewise, solid waste collection system will be employed.</li> </ul>	Yes	2	Checking on site	Build the rest house, septic tank	Agreed	CREB	CREB
<ul style="list-style-type: none"> <li>- Emission levels of all construction vehicles &amp; equipment will conform to Vietnamese emission standards.</li> <li>- Pollutant parameters will be monitored during construction.</li> </ul> Crushing, & concrete plants will be away from population centres at dam and powerhouse sites.	Yes	3	Checking on site				
<ul style="list-style-type: none"> <li>- All precautions to be taken to reduce dust level emissions from batching plants &amp; portable crushers at dam and powerhouse sites.</li> <li>- Regular water spraying at all mixing sites &amp; temporary service roads will be undertaken.</li> </ul> -All delivery vehicles will be covered with tarpaulin.	Yes	2	Checking on site				
<ul style="list-style-type: none"> <li>- All construction equipment &amp; plants will conform to Vietnamese noise standards.</li> <li>- All vehicles &amp; equipment to be fitted with noise</li> </ul>	Yes	2	Checking on site				

Impact / Mitigation Measure (From EMP)	Mitigations Implemented (Yes, No)	Mitigations Effective? (1 to 5)*	Impact Observed / Location	Action Required	Contractor Response / Comment	Endorsed by:	
						Implementing Agency	Monitoring Agency
abatement devices. Construction workers will be provided with personal protection.							
<ul style="list-style-type: none"> <li>- Any blasting works will be in accordance with Vietnamese Explosives Act.</li> <li>- No blasting between dusk &amp; dawn.</li> <li>- Residents close by will be informed well in advance of blasting times.</li> </ul> Workers associated with blasting sites will be provided with earplugs, helmets & other personal safety devices.	Yes	1	Checking on site				
<ul style="list-style-type: none"> <li>- No trees to be removed without prior approval,</li> <li>- Compensation for lost trees on private land,</li> <li>- Planting grass and maintaining</li> </ul> -Tree plantation implemented at dam area, tunnel, penstock, temporary construction areas, roads and other elements of the project. Indigenous tree species being accorded priority over exotic species such as: <i>Acacia Aurculiformis</i> <i>A.Cunn.ex Benth</i>	Yes	2	Checking on site				
-Construction workers to be educated for wildlife conservation with no hunting & poaching to be allowed for workers.	Yes	1	Checking on site				
<ul style="list-style-type: none"> <li>- All blasting sites will have warning &amp; clearance signals. Site will be inspected prior/after blasting.</li> <li>- Workers will be provided with helmets, masks, safety goggles, etc.</li> <li>- A readily available first aid unit will be available with dressing materials etc.</li> <li>- Road safety education will be given to construction vehicle drivers.</li> <li>- Traffic management will be ensured during road construction periods.</li> </ul>	Yes	2	Checking on site				

Impact / Mitigation Measure (From EMP)	Mitigations Implemented (Yes, No)	Mitigations Effective? (1 to 5)*	Impact Observed / Location	Action Required	Contractor Response / Comment	Endorsed by:	
						Implementing Agency	Monitoring Agency
Information dissemination will take place through the Commune's People Committee regarding activities causing disruption.							
- Any public utilities likely to be impacted, such as water supply pipe system, power/phone lines etc. must be relocated to suitable places, in consultation with local beneficiaries.	Yes	1	Checking on site				
- For all finds of an historical or cultural value, work will be stopped and the find reported to the nearest office of the Department Culture, Sport and Tourism or the Department of Culture and Information	Yes	1	Checking on site				

Mitigation Effectiveness Rating Criteria (Indicative examples)

- 11. Very Good (all required mitigations implemented)
- 12. Good ( the majority of required mitigations implemented)
- 13. Fair (some mitigations implemented)
- 14. Poor (few mitigations implemented)
- 15. Very Poor (very few mitigations implemented)

#### 9. Emission Discharge Monitoring (if relevant)

Parameter	Date / Location	Measured by	Monitoring Equipment	Result	Standard	% Exceedence	Action Required	Contractor Responses/ Comments	Endorsed by:	
									Implementing Agency	Monitoring Agency

#### 10. Ambient Monitoring (if relevant)

#### 11. Environmental Incidents During Reporting Period (if relevant)

Environmental Incidents (accidents, spills, complaint)	Date / Location	Reported by	Description / Location	Action Taken	Further Action Required	Endorsed by:	
						Implementing Agency	Monitoring Agency
No Incident occurred							

## 12. Summary of Actions Required and Follow-up (if relevant)

Action Required	Timeframe	Responsible Parties	Follow-up (to be completed if inspection/monitoring indicates actions are required)
Wearing full of personal protection	Immediately	Contractor, Monitoring Agency	<b>Required Action Taken:</b> Contractor has equipped all requirement personal protectional
			<b>Effectiveness:</b> Fairly good
			<b>Further Action Required:</b> N/A
Build the rest house, septic tanks	2 months	Contractor, Monitoring Agency	<b>Required Action Taken:</b> Contractor has built immediately
			<b>Effectiveness:</b> Slowly
			<b>Further Action Required:</b> N/A

**Inspection Completed by:** Central Rural Electric Project Management Board

**Date:** 12<sup>th</sup> Sep 2013

**Signature:** Nguyen Thanh Minh

**Appendix 2: Environmental Monitoring Checklist covering the period July - December 2013****Environmental Monitoring Checklist 1**

PROJECT: A Roang Hydropower Plant

MONITOR NAME: Central Rural Electric Project Management Board

CONTRACTOR NAME: JV between 564 Construction Co., Ltd and 412 Construction JSC (Responsible for Package 10-AR: Construction of road to operation house)

MONITORING TIMING: July – September 2013

WEATHER CONDITIONS: Bad

Environmental Impact/issue Contract/EMP ref	Mitigation Measures	Specific Date Item Monitored	Compliant	Remark	Follow-up actions needed
			Yes/No		
Construction stage					
Earthworks for new access roads and construction of penstock on steep slopes leading to erosion & encroachment	Slopes along access roads & penstock will be provided with: - Catchments/ cut-off drains, silt traps & chutes to minimize soil erosion. - Masonry retaining structures. - Formation of sediment basins & slope drains. - Maximum usage of material in fill areas. - Spoils planning particularly on steep slopes with bench terracing for high cut areas & avoidance of any erosion and runoff of material on down slopes - Planting grass and revegetation on disturbed areas and maintaining of landscaping.	02/07/13	Y		
		17/07/13	Y		
		23/07/13	Y		
		25/07/13	Y		
		04/08/13	Y		
		12/08/13	Y		
		24/08/13	Y		
		31/08/13	Y		
		06/09/13	Y		
		16/09/13	Y		



Environmental Impact/issue Contract/EMP ref	Mitigation Measures	Specific Date Item Monitored	Compliant	Remark	Follow-up actions needed
			Yes/No		
		23/09/13	Y		
		30/09/13	Y		
Use of Borrow Materials with potential for loss and degradation of land	<ul style="list-style-type: none"> <li>- No earth will be borrowed from cultivable and arable lands.</li> <li>- Borrowing to take place from barren, wastelands, &amp; riverbeds.</li> <li>- For new borrow areas, all measures will be taken to avoid loss of any productive soil.</li> <li>- Any borrow areas will be refilled, re-vegetated &amp; landscaped.</li> </ul>	02/07/13	Y		
		17/07/13	Y		
		23/07/13	Y		
		25/07/13	Y		
		04/08/13	Y		
		12/08/13	Y		
		24/08/13	Y		
		31/08/13	Y		
		06/09/13	Y		
		16/09/13	Y		
		23/09/13	Y		
		30/09/13	Y		
Taking of Quarry	- Quarry materials will be obtained from existing operating	02/07/13	Y	The contractor	

Environmental Impact/issue Contract/EMP ref	Mitigation Measures	Specific Date Item Monitored	Compliant	Remark	Follow-up actions needed
			Yes/No		
Materials with loss and degradation of land	sites with proper licenses & environmental clearances. - New quarries to be opened only with permission of respective authorities.	17/07/13	Y	buys materials at A Luoi district	
		23/07/13	Y		
		25/07/13	Y		
		04/08/13	Y	The contractor buys materials at A Luoi district	
		12/08/13	Y		
		24/08/13	Y		
		31/08/13	Y		
		06/09/13	Y	The contractor buys materials at A Luoi district	
		16/09/13	Y		
		23/09/13	Y		
		30/09/13	Y		
Operation of construction equipment and construction activities and contamination of soils, loss of water quality & water pollution	- Fuel storage & refuelling will have adequate containment, away from water bodies/channel. Equipment will be properly maintained. - Precautions to be taken to prevent water pollution due to increased siltation & turbidity for weir site & road construction particularly in dry month when flows are low. - Approved sites defined for storage & disposal of wastes materials - Any waste petroleum products will be collected, stored, & disposed of at approved sites.	02/07/13	Y	The contractor did not contain waste of asphalt	Require contractor to provide storage
		17/07/13	Y		
		23/07/13	Y		
		25/07/13	Y		
		04/08/13	Y		

Environmental Impact/issue Contract/EMP ref	Mitigation Measures	Specific Date Item Monitored	Compliant	Remark	Follow-up actions needed
			Yes/No		
		12/08/13	Y		
		24/08/13	Y		
		31/08/13	Y		
		06/09/13	Y		
		16/09/13	Y		
		23/09/13	Y		
		30/09/13	Y		
Construction activities causing disruption of existing surface drains.	<ul style="list-style-type: none"> <li>- Appropriate rain-storm-water channels will be constructed.</li> <li>- Provision for cross drainage structures will be made.</li> </ul>	02/07/13	Y		
		17/07/13	Y		
		23/07/13	Y		
		25/07/13	Y		
		04/08/13	Y		
		12/08/13	Y		
		24/08/13	Y		
		31/08/13	Y		
		06/09/13	Y		

Environmental Impact/issue Contract/EMP ref	Mitigation Measures	Specific Date Item Monitored	Compliant	Remark	Follow-up actions needed
			Yes/No		
		16/09/13	Y		
		23/09/13	Y		
		30/09/13	Y		
Construction Camp & Residential colony. Social impacts & pollution from wastewater & solid waste	<ul style="list-style-type: none"> <li>- Construction camps will be located adjoining the dam and powerhouse sites &amp; away from any settlement. Manual labour will be employed locally.</li> <li>- Camps &amp; residential colony will have properly designed sewage treatment system for wastewater effluent. Likewise, solid waste collection system will be employed.</li> </ul>	02/07/13	N	Rain-storm water front of camps is blocked	Require contractor to clear the rain-storm water
		17/07/13	N		
		23/07/13	Y		
		25/07/13	Y		
		04/08/13	N	Workers didn't collect waste to approval area, workers collected waste to approval area	Require workers to collect waste to approval area
		12/08/13	Y		
		24/08/13	Y		
		31/08/13	Y		
		06/09/13	Y		
		16/09/13	Y		
		23/09/13	Y		
		30/09/13	Y		

Environmental Impact/issue Contract/EMP ref	Mitigation Measures	Specific Date Item Monitored	Compliant	Remark	Follow-up actions needed
			Yes/No		
Emission from Construction Vehicles & Equipment causing air pollution	<ul style="list-style-type: none"> <li>- Emission levels of all construction vehicles &amp; equipment will conform to Vietnamese emission standards.</li> <li>- Pollutant parameters will be monitored during construction.</li> <li>- Crushing, &amp; concrete plants will be away from population centres at dam and powerhouse sites.</li> </ul>	02/07/13	Y		
		17/07/13	Y		
		23/07/13	Y		
		25/07/13	Y		
		04/08/13	Y		
		12/08/13	Y		
		24/08/13	Y		
		31/08/13	Y		
		06/09/13	Y		
		16/09/13	Y		
		23/09/13	Y		
		30/09/13	Y		
Dust particulates causing health impacts for workers and villagers	<ul style="list-style-type: none"> <li>- All precautions to be taken to reduce dust level emissions from batching plants &amp; portable crushers at dam and powerhouse sites.</li> <li>- Regular water spraying at all mixing sites &amp; temporary</li> </ul>	02/07/13	Y		
		17/07/13	Y		
		23/07/13	Y		

Environmental Impact/issue Contract/EMP ref	Mitigation Measures	Specific Date Item Monitored	Compliant	Remark	Follow-up actions needed
			Yes/No		
	service roads will be undertaken. - All delivery vehicles will be covered with tarpaulin.	25/07/13	Y		
		04/08/13	Y		
		12/08/13	Y		
		24/08/13	Y		
		31/08/13	Y		
		06/09/13	Y		
		16/09/13	Y		
		23/09/13	Y		
		30/09/13	Y		
Construction activity Noise from Vehicles, Plant & Equipment causing noise pollution	- All construction equipment & plants will conform to Vietnamese noise standards. - All vehicles & equipment to be fitted with noise abatement devices. - Construction workers will be provided with personal protection.	02/07/13	Y		
		17/07/13	Y		
		23/07/13	Y		
		25/07/13	Y		
		04/08/13	Y		
		12/08/13	Y		
		24/08/13	Y		
		31/08/13	Y		
		06/09/13	Y		
		16/09/13	Y		

Environmental Impact/issue Contract/EMP ref	Mitigation Measures	Specific Date Item Monitored	Compliant Yes/No	Remark	Follow-up actions needed
		23/09/13	Y		
		30/09/13	Y		
Noise pollution from any blasting activities at dam and power tunnel and penstock,	<ul style="list-style-type: none"> <li>- Any blasting works will be in accordance with Vietnamese Explosives Act.</li> <li>- No blasting between dusk &amp; dawn.</li> <li>- Residents close by will be informed well in advance of blasting times.</li> <li>- Workers associated with blasting sites will be provided with earplugs, helmets &amp; other personal safety devices.</li> </ul>	02/07/13	Y	There was no blasting done during the monitoring period	
		17/07/13	Y		
		23/07/13	Y		
		25/07/13	Y		
		04/08/13	Y	There was no blasting done during the monitoring period	
		12/08/13	Y		
		24/08/13	Y		
		31/08/13	Y		
		06/09/13	Y		
		16/09/13	Y		
		23/09/13	Y		

Environmental Impact/issue Contract/EMP ref	Mitigation Measures	Specific Date Item Monitored	Compliant	Remark	Follow-up actions needed
			Yes/No		
		30/09/13	Y		
Construction of dam, reservoir, tunnel, penstock with loss of vegetation & tree cover.	<ul style="list-style-type: none"> <li>- No trees to be removed without prior approval,</li> <li>- Compensation for lost trees on private land,</li> <li>- Planting grass and maintaining</li> <li>- Tree plantation implemented at dam area, tunnel, penstock, temporary construction areas, roads and other elements of the project. Indigenous tree species being accorded priority over exotic species such as: <i>Acacia Aurculiformis</i> A.Cunn.ex Benth</li> </ul>	02/07/13	Y		
		17/07/13	Y		
		23/07/13	Y		
		25/07/13	Y		
		04/08/13	Y		
		12/08/13	Y		
		24/08/13	Y		
		31/08/13	Y		
		06/09/13	Y		
		16/09/13	Y		
		23/09/13	Y		
		30/09/13	Y		
Work force during construction causing impacts to wildlife	<ul style="list-style-type: none"> <li>- Construction workers to be educated for wildlife conservation with no hunting &amp; poaching to be allowed for workers.</li> </ul>	02/07/13	Y		
		17/07/13	Y		
		23/07/13	Y		
		25/07/13	Y		



Environmental Impact/issue Contract/EMP ref	Mitigation Measures	Specific Date Item Monitored	Compliant	Remark	Follow-up actions needed
			Yes/No		
		04/08/13	Y		
		12/08/13	Y		
		24/08/13	Y		
		31/08/13	Y		
		06/09/13	Y		
		16/09/13	Y		
		23/09/13	Y		
		30/09/13	Y		
	<ul style="list-style-type: none"> <li>- All blasting sites will have warning &amp; clearance signals. Site will be inspected prior/after blasting.</li> <li>- Workers will be provided with helmets, masks, safety goggles, etc.</li> <li>- A readily available first aid unit will be available with dressing materials etc.</li> <li>- Road safety education will be given to construction vehicle drivers.</li> <li>- Traffic management will be ensured during road construction periods.</li> <li>- Information dissemination will take place through the Commune's People Committee regarding activities causing disruption.</li> </ul>	02/07/13	Y	Contractor provided the first-aid kit Contractor provided signals at dangerous area	
		17/07/13	Y		
		23/07/13	Y		
		25/07/13	Y		
		04/08/13	Y	There was no blasting done during the monitoring period	Require contractor to provide protection personal for
		12/08/13	Y		

Environmental Impact/issue Contract/EMP ref	Mitigation Measures	Specific Date Item Monitored	Compliant	Remark	Follow-up actions needed workers
			Yes/No		
		24/08/13	Y		
		31/08/13	Y		
		06/09/13	Y		
		16/09/13	Y		
		23/09/13	Y		
		30/09/13	Y		
Construction Activities causing disruption to Public Utilities	- Any public utilities likely to be impacted, such as water supply pipe system, power/phone lines etc. must be relocated to suitable places, in consultation with local beneficiaries.	02/07/13	Y		
		17/07/13	Y		
		23/07/13	Y		
		25/07/13	Y		
		04/08/13	Y		
		12/08/13	Y		
		24/08/13	Y		

Environmental Impact/issue Contract/EMP ref	Mitigation Measures	Specific Date Item Monitored	Compliant Yes/No	Remark	Follow-up actions needed
		31/08/13	Y		
		06/09/13	Y		
		16/09/13	Y		
		23/09/13	Y		
		30/09/13	Y		
Any discovery of artifacts or articles of historical interest and importance	- For all finds of an historical or cultural value, work will be stopped and the find reported to the nearest office of the Department Culture, Sport and Tourism or the Department of Culture and Information	02/07/13	Y	There was not historical or cultural value	
		17/07/13	Y		
		23/07/13	Y		
		25/07/13	Y		
		04/08/13	Y		
		12/08/13	Y		
		24/08/13	Y		
		31/08/13	Y		
		06/09/13	Y		
		16/09/13	Y		
		23/09/13	Y		

Environmental Impact/issue Contract/EMP ref	Mitigation Measures	Specific Date Item Monitored	Compliant	Remark	Follow-up actions needed
		30/09/13	Yes/No		
			Y		

Supervisor

Signed

Tran Van Tung

## Environmental Monitoring Checklist 2

PROJECT: A Roang Hydropower Plant

MONITOR NAME: Central Rural Electric Project Management Board

CONTRACTOR NAME: JV between 564 Construction Co., Ltd and 412 Construction JSC (Responsible for Package 10-AR: Construction of road to operation house)

MONITORING TIMING: October - December 2013

WEATHER CONDITIONS: Bad

Environmental Impact/issue Contract/EMP ref	Mitigation Measures	Specific Date Item Monitored	Compliant	Remark	Follow-up actions needed
			Yes/No		
Construction stage					
Earthworks for new access roads and construction of penstock on steep slopes leading to erosion & encroachment	Slopes along access roads & penstock will be provided with: - Catchments/ cut-off drains, silt traps & chutes to minimize soil erosion. - Masonry retaining structures. - Formation of sediment basins & slope drains. - Maximum usage of material in fill areas. - Spoils planning particularly on steep slopes with bench terracing for high cut areas & avoidance of any erosion and runoff of material on down slopes - Planting grass and revegetation on disturbed areas and maintaining of landscaping.	04/10/2013	Y		
		11/10/2013	Y		
		25/10/2013	Y		
		31/10/2013	Y		
		03/11/2013	Y		
		08/11/2013	Y		
		07/11/2013	Y		
		29/11/2013	Y		
		02/12/2013	Y		
		09/12/2013	Y		

Environmental Impact/issue Contract/EMP ref	Mitigation Measures	Specific Date Item Monitored	Compliant	Remark	Follow-up actions needed
			Yes/No		
		19/12/2013	Y		
		30/12/2013	Y		
Use of Borrow Materials with potential for loss and degradation of land	<ul style="list-style-type: none"> <li>- No earth will be borrowed from cultivable and arable lands.</li> <li>- Borrowing to take place from barren, wastelands, &amp; riverbeds.</li> <li>- For new borrow areas, all measures will be taken to avoid loss of any productive soil.</li> <li>- Any borrow areas will be refilled, re-vegetated &amp; landscaped.</li> </ul>	04/10/2013	Y		
		11/10/2013	Y		
		25/10/2013	Y		
		31/10/2013			
		03/11/2013	Y		
		08/11/2013	Y		
		07/11/2013	Y		
		29/11/2013	Y		
		02/12/2013	Y		
		09/12/2013	Y		
		19/12/2013	Y		
		30/12/2013	Y		
Taking of Quarry	- Quarry materials will be obtained from existing operating	04/10/2013	Y		

Environmental Impact/issue Contract/EMP ref	Mitigation Measures	Specific Date Item Monitored	Compliant	Remark	Follow-up actions needed
			Yes/No		
Materials with loss and degradation of land	sites with proper licenses & environmental clearances. - New quarries to be opened only with permission of respective authorities.	11/10/2013	Y		
		25/10/2013	Y		
		31/10/2013			
		03/11/2013	Y		
		08/11/2013	Y		
		07/11/2013	Y		
		29/11/2013	Y		
		02/12/2013	Y		
		09/12/2013	Y		
		19/12/2013	Y		
		30/12/2013	Y		
Operation of construction equipment and construction activities and contamination of soils, loss of water quality & water pollution	- Fuel storage & refuelling will have adequate containment, away from water bodies/channel. Equipment will be properly maintained. - Precautions to be taken to prevent water pollution due to increased siltation & turbidity for weir site & road construction particularly in dry month when flows are low. - Approved sites defined for storage & disposal of wastes materials - Any waste petroleum products will be collected, stored, & disposed of at approved sites.	04/10/2013	Y	After repairing equipments, clouts is not collected to approval area	Require contractor to collect clouts to landfills
		11/10/2013	N		
		25/10/2013	N		
		31/10/2013	Y		
		03/11/2013	Y		

Environmental Impact/issue Contract/EMP ref	Mitigation Measures	Specific Date Item Monitored	Compliant	Remark	Follow-up actions needed
			Yes/No		
		08/11/2013	Y		
		07/11/2013	Y		
		29/11/2013	Y		
		02/12/2013	Y	When repairing equipment, there were oil, waste on the site	Require contractor to collect oil, waste when repairing equipment
		09/12/2013	N		
		19/12/2013	Y		
		30/12/2013	Y		
Construction activities causing disruption of existing surface drains.	<ul style="list-style-type: none"> <li>- Appropriate rain-storm-water channels will be constructed.</li> <li>- Provision for cross drainage structures will be made.</li> </ul>	04/10/2013	Y		
		11/10/2013	Y		
		25/10/2013	Y		
		31/10/2013	Y		
		03/11/2013	Y		
		08/11/2013	Y		
		07/11/2013	Y		
		29/11/2013	Y		
		02/12/2013	Y		



Environmental Impact/issue Contract/EMP ref	Mitigation Measures	Specific Date Item Monitored	Compliant	Remark	Follow-up actions needed
			Yes/No		
		09/12/2013	Y		
		19/12/2013	Y		
		30/12/2013	Y		
Construction Camp & Residential colony. Social impacts & pollution from wastewater & solid waste	<ul style="list-style-type: none"> <li>- Construction camps will be located adjoining the dam and powerhouse sites &amp; away from any settlement. Manual labour will be employed locally.</li> <li>- Camps &amp; residential colony will have properly designed sewage treatment system for wastewater effluent. Likewise, solid waste collection system will be employed.</li> </ul>	04/10/2013	Y	Workers did not collect waste around camps	Require contractor to collect waste
		11/10/2013	Y		
		25/10/2013	Y		
		31/10/2013	N		
		03/11/2013	N		
		08/11/2013	Y		
		07/11/2013	Y		
		29/11/2013	Y		
		02/12/2013	Y		
		09/12/2013	Y		
		19/12/2013	Y		
		30/12/2013	Y		

Environmental Impact/issue Contract/EMP ref	Mitigation Measures	Specific Date Item Monitored	Compliant	Remark	Follow-up actions needed
			Yes/No		
Emission from Construction Vehicles & Equipment causing air pollution	<ul style="list-style-type: none"> <li>- Emission levels of all construction vehicles &amp; equipment will conform to Vietnamese emission standards.</li> <li>- Pollutant parameters will be monitored during construction.</li> <li>- Crushing, &amp; concrete plants will be away from population centres at dam and powerhouse sites.</li> </ul>	04/10/2013	Y		
		11/10/2013	Y		
		25/10/2013	Y		
		31/10/2013			
		03/11/2013	Y		
		08/11/2013	Y		
		07/11/2013	Y		
		29/11/2013	Y		
		02/12/2013	Y		
		09/12/2013	Y		
		19/12/2013	Y		
		30/12/2013	Y		
Dust particulates causing health impacts for workers and villagers	<ul style="list-style-type: none"> <li>- All precautions to be taken to reduce dust level emissions from batching plants &amp; portable crushers at dam and powerhouse sites.</li> <li>- Regular water spraying at all mixing sites &amp; temporary</li> </ul>	04/10/2013	Y		
		11/10/2013	Y		
		25/10/2013	Y		

Environmental Impact/issue Contract/EMP ref	Mitigation Measures	Specific Date Item Monitored	Compliant	Remark	Follow-up actions needed
			Yes/No		
	service roads will be undertaken. - All delivery vehicles will be covered with tarpaulin.	31/10/2013			
		03/11/2013	Y		
		08/11/2013	Y		
		07/11/2013	Y		
		29/11/2013	Y		
		02/12/2013	Y		
		09/12/2013	Y		
		19/12/2013	Y		
		30/12/2013	Y		
Construction activity Noise from Vehicles, Plant & Equipment causing noise pollution	- All construction equipment & plants will conform to Vietnamese noise standards. - All vehicles & equipment to be fitted with noise abatement devices. - Construction workers will be provided with personal protection.	04/10/2013	Y		
		11/10/2013	Y		
		25/10/2013	Y		
		31/10/2013			
		03/11/2013	Y		
		08/11/2013	Y		
		07/11/2013	Y		
		29/11/2013	Y		
		02/12/2013	Y		
		09/12/2013	Y		

Environmental Impact/issue Contract/EMP ref	Mitigation Measures	Specific Date Item Monitored	Compliant	Remark	Follow-up actions needed
			Yes/No		
		19/12/2013	Y		
		30/12/2013	Y		
Noise pollution from any blasting activities at dam and power tunnel and penstock,	<ul style="list-style-type: none"> <li>- Any blasting works will be in accordance with Vietnamese Explosives Act.</li> <li>- No blasting between dusk &amp; dawn.</li> <li>- Residents close by will be informed well in advance of blasting times.</li> <li>- Workers associated with blasting sites will be provided with earplugs, helmets &amp; other personal safety devices.</li> </ul>	04/10/2013	Y	Blasting was done following to Vietnam regulation. Start blasting in 5 <sup>th</sup> April, 2013	
		11/10/2013	Y		
		25/10/2013	Y		
		31/10/2013			
		03/11/2013	Y		
		08/11/2013	Y		
		07/11/2013	Y		
		29/11/2013	Y		
		02/12/2013	Y		
		09/12/2013	Y		
		19/12/2013	Y		

Environmental Impact/issue Contract/EMP ref	Mitigation Measures	Specific Date Item Monitored	Compliant	Remark	Follow-up actions needed
			Yes/No		
		30/12/2013	Y		
Construction of dam, reservoir, tunnel, penstock with loss of vegetation & tree cover.	<ul style="list-style-type: none"> <li>- No trees to be removed without prior approval,</li> <li>- Compensation for lost trees on private land,</li> <li>- Planting grass and maintaining</li> <li>- Tree plantation implemented at dam area, tunnel, penstock, temporary construction areas, roads and other elements of the project. Indigenous tree species being accorded priority over exotic species such as: <i>Acacia Aurculiformis</i> A.Cunn.ex Benth</li> </ul>	04/10/2013	Y		
		11/10/2013	Y		
		25/10/2013	Y		
		31/10/2013			
		03/11/2013	Y		
		08/11/2013	Y		
		07/11/2013	Y		
		29/11/2013	Y		
		02/12/2013	Y		
		09/12/2013	Y		
		19/12/2013	Y		
		30/12/2013	Y		
Work force during construction causing impacts to wildlife	<ul style="list-style-type: none"> <li>- Construction workers to be educated for wildlife conservation with no hunting &amp; poaching to be allowed for workers.</li> </ul>	04/10/2013	Y		
		11/10/2013	Y		
		25/10/2013	Y		
		31/10/2013			

Environmental Impact/issue Contract/EMP ref	Mitigation Measures	Specific Date Item Monitored	Compliant	Remark	Follow-up actions needed
			Yes/No		
		03/11/2013	Y		
		08/11/2013	Y		
		07/11/2013	Y		
		29/11/2013	Y		
		02/12/2013	Y		
		09/12/2013	Y		
		19/12/2013	Y		
		30/12/2013	Y		
		Construction Activities & Accident Risks	<ul style="list-style-type: none"> <li>- All blasting sites will have warning &amp; clearance signals. Site will be inspected prior/after blasting.</li> <li>- Workers will be provided with helmets, masks, safety goggles, etc.</li> <li>- A readily available first aid unit will be available with dressing materials etc.</li> <li>- Road safety education will be given to construction vehicle drivers.</li> <li>- Traffic management will be ensured during road construction periods.</li> <li>- Information dissemination will take place through the Commune’s People Committee regarding activities causing disruption.</li> </ul>	04/10/2013	N
11/10/2013	N				
25/10/2013	N				
31/10/2013	Y				
03/11/2013	N			Some of workers didn’t have full of protection personals when blasting	Require contractor to provide full of protection personals
08/11/2013	N				

Environmental Impact/issue Contract/EMP ref	Mitigation Measures	Specific Date Item Monitored	Compliant	Remark	Follow-up actions needed for workers when doing blasting
			Yes/No		
		07/11/2013	Y		
		29/11/2013	Y		
		02/12/2013	Y		
		09/12/2013	Y		
		19/12/2013	Y		
		30/12/2013	Y		
Construction Activities causing disruption to Public Utilities	- Any public utilities likely to be impacted, such as water supply pipe system, power/phone lines etc. must be relocated to suitable places, in consultation with local beneficiaries.	04/10/2013	Y		
		11/10/2013	Y		
		25/10/2013	Y		
		31/10/2013			
		03/11/2013	Y		
		08/11/2013	Y		
		07/11/2013	Y		

Environmental Impact/issue Contract/EMP ref	Mitigation Measures	Specific Date Item Monitored	Compliant	Remark	Follow-up actions needed
			Yes/No		
		29/11/2013	Y		
		02/12/2013	Y		
		09/12/2013	Y		
		19/12/2013	Y		
		30/12/2013	Y		
Any discovery of artifacts or articles of historical interest and importance	- For all finds of an historical or cultural value, work will be stopped and the find reported to the nearest office of the Department Culture, Sport and Tourism or the Department of Culture and Information	04/10/2013	Y		
		11/10/2013	Y		
		25/10/2013	Y		
		31/10/2013			
		03/11/2013	Y		
		08/11/2013	Y		
		07/11/2013	Y		
		29/11/2013	Y		
		02/12/2013	Y		
		09/12/2013	Y		
		19/12/2013	Y		



Environmental Impact/issue Contract/EMP ref	Mitigation Measures	Specific Date Item Monitored	Compliant	Remark	Follow-up actions needed
		30/12/2013	Yes/No		
			Y		

Supervisor

Signed

Tran Van Tung

### Environmental Monitoring Checklist 3

PROJECT: A Roang Hydropower Plant

MONITOR NAME: Central Rural Electric Project Management Board

CONTRACTOR NAME: JV between Song Da 9.01 JSC and Song Da 505 JSC (Responsible for Package 19-AR: Construction of head work)

MONITORING TIMING: July - September 2013

WEATHER CONDITIONS: Bad

Environmental Impact/issue Contract/EMP ref	Mitigation Measures	Specific Date Item Monitored	Compliant	Remark	Follow-up actions needed
			Yes/No		
Construction stage					
Earthworks for new access roads and construction of penstock on steep slopes leading to erosion & encroachment	Slopes along access roads & penstock will be provided with: - Catchments/ cut-off drains, silt traps & chutes to minimize soil erosion. - Masonry retaining structures. - Formation of sediment basins & slope drains. - Maximum usage of material in fill areas. - Spoils planning particularly on steep slopes with bench terracing for high cut areas & avoidance of any erosion and runoff of material on down slopes - Planting grass and revegetation on disturbed areas and maintaining of landscaping.	05/07/2013	Y		
		14/07/2013	Y		
		21/07/2013	Y		
		29/07/2013	Y		
		05/08/2013	Y		
		14/08/2013	Y		
		20/08/2013	Y		
		20/08/2013	Y		
		06/09/2013	Y		
		11/09/2013	Y		
		19/09/2013	Y		
		26/09/2013	Y		

Environmental Impact/issue Contract/EMP ref	Mitigation Measures	Specific Date Item Monitored	Compliant	Remark	Follow-up actions needed
			Yes/No		
Use of Borrow Materials with potential for loss and degradation of land	<ul style="list-style-type: none"> <li>- No earth will be borrowed from cultivable and arable lands.</li> <li>- Borrowing to take place from barren, wastelands, &amp; riverbeds.</li> <li>- For new borrow areas, all measures will be taken to avoid loss of any productive soil.</li> <li>- Any borrow areas will be refilled, re-vegetated &amp; landscaped.</li> </ul>	05/07/2013	Y		
		14/07/2013	Y		
		21/07/2013	Y		
		29/07/2013	Y		
		05/08/2013	Y		
		14/08/2013	Y		
		20/08/2013	Y		
		20/08/2013	Y		
		06/09/2013	Y		
		11/09/2013	Y		
		19/09/2013	Y		
		26/09/2013	Y		
Taking of Quarry Materials with loss and degradation of land	<ul style="list-style-type: none"> <li>- Quarry materials will be obtained from existing operating sites with proper licenses &amp; environmental clearances.</li> <li>- New quarries to be opened only with permission of respective authorities.</li> </ul>	05/07/2013	Y		
		14/07/2013	Y		
		21/07/2013	Y		

Environmental Impact/issue Contract/EMP ref	Mitigation Measures	Specific Date Item Monitored	Compliant Yes/No	Remark	Follow-up actions needed
		29/07/2013	Y		
		05/08/2013	Y		
		14/08/2013	Y		
		20/08/2013	Y		
		20/08/2013	Y		
		06/09/2013	Y		
		11/09/2013	Y		
		19/09/2013	Y		
		26/09/2013	Y		
Operation of construction equipment and construction activities and contamination of soils, loss of water quality & water pollution	<ul style="list-style-type: none"> <li>- Fuel storage &amp; refuelling will have adequate containment, away from water bodies/channel. Equipment will be properly maintained.</li> <li>- Precautions to be taken to prevent water pollution due to increased siltation &amp; turbidity for weir site &amp; road construction particularly in dry month when flows are low.</li> <li>- Approved sites defined for storage &amp; disposal of wastes materials</li> <li>- Any waste petroleum products will be collected, stored, &amp; disposed of at approved sites.</li> </ul>	05/07/2013	N	Storages of oil are scattered around the site	Require contractor to collect oil storages to approval site
		14/07/2013	Y		
		21/07/2013	Y		
		29/07/2013	Y		
		05/08/2013	N	Storages of oil are scattered around the site	Require contractor to collect oil storages to approval site
		14/08/2013	Y		
		20/08/2013	Y		

Environmental Impact/issue Contract/EMP ref	Mitigation Measures	Specific Date Item Monitored	Compliant Yes/No	Remark	Follow-up actions needed
		20/08/2013	Y		
		06/09/2013	Y		
		11/09/2013	Y		
		19/09/2013	Y		
		26/09/2013	Y		
Construction activities causing disruption of existing surface drains.	<ul style="list-style-type: none"> <li>- Appropriate rain-storm-water channels will be constructed.</li> <li>- Provision for cross drainage structures will be made.</li> </ul>	05/07/2013	Y		
		14/07/2013	Y		
		21/07/2013	Y		
		29/07/2013	Y		
		05/08/2013	Y		
		14/08/2013	Y		
		20/08/2013	Y		
		20/08/2013	Y		
		06/09/2013	Y		
		11/09/2013	Y		
		19/09/2013	Y		
		26/09/2013	Y		

Environmental Impact/issue Contract/EMP ref	Mitigation Measures	Specific Date Item Monitored	Compliant	Remark	Follow-up actions needed
			Yes/No		
Construction Camp & Residential colony. Social impacts & pollution from wastewater & solid waste	<ul style="list-style-type: none"> <li>- Construction camps will be located adjoining the dam and powerhouse sites &amp; away from any settlement. Manual labour will be employed locally.</li> <li>- Camps &amp; residential colony will have properly designed sewage treatment system for wastewater effluent. Likewise, solid waste collection system will be employed.</li> </ul>	05/07/2013	Y	Rain-storm water front of camps is blocked	Require contractor to clear rain-storm water
		14/07/2013	Y		
		21/07/2013	Y		
		29/07/2013	Y		
		05/08/2013	Y		
		14/08/2013	Y		
		20/08/2013	Y		
		20/08/2013	Y		
		06/09/2013	N	Rain-storm water front of camps is blocked	Require contractor to clear rain-storm water
		11/09/2013	N		
		19/09/2013	Y		
		26/09/2013	Y		
Emission from Construction Vehicles & Equipment causing	<ul style="list-style-type: none"> <li>- Emission levels of all construction vehicles &amp; equipment will conform to Vietnamese emission standards.</li> <li>- Pollutant parameters will be monitored during construction.</li> </ul>	05/07/2013	Y		
		14/07/2013	Y		

Environmental Impact/issue Contract/EMP ref	Mitigation Measures	Specific Date Item Monitored	Compliant	Remark	Follow-up actions needed
			Yes/No		
air pollution	- Crushing, & concrete plants will be away from population centres at dam and powerhouse sites.	21/07/2013	Y		
		29/07/2013	Y		
		05/08/2013	Y		
		14/08/2013	Y		
		20/08/2013	Y		
		20/08/2013	Y		
		06/09/2013	Y		
		11/09/2013	Y		
		19/09/2013	Y		
		26/09/2013	Y		
Dust particulates causing health impacts for workers and villagers	<ul style="list-style-type: none"> <li>- All precautions to be taken to reduce dust level emissions from batching plants &amp; portable crushers at dam and powerhouse sites.</li> <li>- Regular water spraying at all mixing sites &amp; temporary service roads will be undertaken.</li> <li>- All delivery vehicles will be covered with tarpaulin.</li> </ul>	05/07/2013	Y	Some trucks are not covered and the roads are not water sprayed	Require contractor to water spray and cover vehicles
		14/07/2013	N		
		21/07/2013	N		
		29/07/2013	Y		
		05/08/2013	N	Some trucks are not covered and the roads are not	Require contractor to water spray
		14/08/2013	N		

Environmental Impact/issue Contract/EMP ref	Mitigation Measures	Specific Date Item Monitored	Compliant	Remark	Follow-up actions needed and cover vehicles
			Yes/No		
		20/08/2013	Y	water sprayed	
		20/08/2013	Y		
		06/09/2013	Y	In this month, it rained much, so no need to regular water spray	
		11/09/2013	Y		
		19/09/2013	Y		
		26/09/2013	Y		
Construction activity Noise from Vehicles, Plant & Equipment causing noise pollution	<ul style="list-style-type: none"> <li>- All construction equipment &amp; plants will conform to Vietnamese noise standards.</li> <li>- All vehicles &amp; equipment to be fitted with noise abatement devices.</li> <li>- Construction workers will be provided with personal protection.</li> </ul>	05/07/2013	Y		
		14/07/2013	Y		
		21/07/2013	Y		
		29/07/2013	Y		
		05/08/2013	Y		
		14/08/2013	Y		
		20/08/2013	Y		
		20/08/2013	Y		
		06/09/2013	Y		
		11/09/2013	Y		
		19/09/2013	Y		
		26/09/2013	Y		
Noise pollution from any blasting	- Any blasting works will be in accordance with Vietnamese Explosives Act.	05/07/2013	N	Workers did not wear earplugs	Require contractor to



Environmental Impact/issue Contract/EMP ref activities at dam and power tunnel and penstock,	Mitigation Measures	Specific Date Item Monitored	Compliant	Remark	Follow-up actions needed
			Yes/No		
	<ul style="list-style-type: none"> <li>- No blasting between dusk &amp; dawn.</li> <li>- Residents close by will be informed well in advance of blasting times.</li> <li>- Workers associated with blasting sites will be provided with earplugs, helmets &amp; other personal safety devices.</li> </ul>	14/07/2013	Y	when blasting	remind workers to wear full of protection personal
		21/07/2013	Y		
		29/07/2013	Y		
		05/08/2013	Y		
		14/08/2013	Y		
		20/08/2013	Y		
		20/08/2013	Y		
		06/09/2013	Y		Require contractor to inform the time of blasting for residents soon
		11/09/2013	Y		
		19/09/2013	Y		
		26/09/2013	Y		
Construction of dam, reservoir, tunnel, penstock with loss of	<ul style="list-style-type: none"> <li>- No trees to be removed without prior approval,</li> <li>- Compensation for lost trees on private land,</li> <li>- Planting grass and maintaining</li> </ul>	05/07/2013	Y		
		14/07/2013	Y		

Environmental Impact/issue Contract/EMP ref vegetation & tree cover.	Mitigation Measures	Specific Date Item Monitored	Compliant Yes/No	Remark	Follow-up actions needed
- Tree plantation implemented at dam area, tunnel, penstock, temporary construction areas, roads and other elements of the project. Indigenous tree species being accorded priority over exotic species such as: Acacia Aurculiformis A.Cunn.ex Benth		21/07/2013	Y		
		29/07/2013	Y		
		05/08/2013	Y		
		14/08/2013	Y		
		20/08/2013	Y		
		20/08/2013	Y		
		06/09/2013	Y		
		11/09/2013	Y		
		19/09/2013	Y		
		26/09/2013	Y		
Work force during construction causing impacts to wildlife	- Construction workers to be educated for wildlife conservation with no hunting & poaching to be allowed for workers.	05/07/2013	Y		
		14/07/2013	Y		
		21/07/2013	Y		
		29/07/2013	Y		
		05/08/2013	Y		
		14/08/2013	Y		
		20/08/2013	Y		
		20/08/2013	Y		

Environmental Impact/issue Contract/EMP ref	Mitigation Measures	Specific Date Item Monitored	Compliant	Remark	Follow-up actions needed
			Yes/No		
Construction Activities & Accident Risks	<ul style="list-style-type: none"> <li>- All blasting sites will have warning &amp; clearance signals. Site will be inspected prior/after blasting.</li> <li>- Workers will be provided with helmets, masks, safety goggles, etc.</li> <li>- A readily available first aid unit will be available with dressing materials etc.</li> <li>- Road safety education will be given to construction vehicle drivers.</li> <li>- Traffic management will be ensured during road construction periods.</li> <li>- Information dissemination will take place through the Commune's People Committee regarding activities causing disruption.</li> </ul>	06/09/2013	Y		
		11/09/2013	Y		
		19/09/2013	Y		
		26/09/2013	Y		
		05/07/2013	Y	Some of workers did not wear the helmets	Require contractor to provide full of protection personal for workers when blasting
		14/07/2013	Y		
		21/07/2013	Y		
		29/07/2013	Y		
		05/08/2013	N	Some of workers did not wear the helmets	Require contractor to provide full of protection personal for workers when blasting
		14/08/2013	Y		
		20/08/2013	Y		
		20/08/2013	Y		

Environmental Impact/issue Contract/EMP ref	Mitigation Measures	Specific Date Item Monitored	Compliant	Remark	Follow-up actions needed
			Yes/No		
		06/09/2013	Y		
		11/09/2013	Y		
		19/09/2013	Y		
		26/09/2013	Y		
Construction Activities causing disruption to Public Utilities	- Any public utilities likely to be impacted, such as water supply pipe system, power/phone lines etc. must be relocated to suitable places, in consultation with local beneficiaries.	05/07/2013	Y		
		14/07/2013	Y		
		21/07/2013	Y		
		29/07/2013	Y		
		05/08/2013	Y		When leveling landfill, require contractor to mind the poweline for administration house
		14/08/2013	Y		
		20/08/2013	Y		
		20/08/2013	Y		
		06/09/2013	Y		
		11/09/2013	Y		

Environmental Impact/issue Contract/EMP ref	Mitigation Measures	Specific Date Item Monitored	Compliant	Remark	Follow-up actions needed
			Yes/No		
Any discovery of artifacts or articles of historical interest and importance	- For all finds of an historical or cultural value, work will be stopped and the find reported to the nearest office of the Department Culture, Sport and Tourism or the Department of Culture and Information	19/09/2013	Y	There were not historical or cultural value	
		26/09/2013	Y		
		05/07/2013	Y		
		14/07/2013	Y		
		21/07/2013	Y		
		29/07/2013	Y		
		05/08/2013	Y		
		14/08/2013	Y		
		20/08/2013	Y		
		20/08/2013	Y		
		06/09/2013	Y		
		11/09/2013	Y		
		19/09/2013	Y		
		26/09/2013	Y		

Supervisor  
Signed  
Doan Van So

### Environmental Monitoring Checklist 4

PROJECT: A Roang Hydropower Plant

MONITOR NAME: Central Rural Electric Project Management Board

CONTRACTOR NAME: JV between Song Da 9.01 JSC and Song Da 505 JSC (Responsible for Package 19-AR: Construction of head work)

MONITORING TIMING: October – December 2013

WEATHER CONDITIONS: Bad

Environmental Impact/issue Contract/EMP ref	Mitigation Measures	Specific Date Item Monitored	Compliant	Remark	Follow-up actions needed
			Yes/No		
Construction stage					
Earthworks for new access roads and construction of penstock on steep slopes leading to erosion & encroachment	Slopes along access roads & penstock will be provided with: - Catchments/ cut-off drains, silt traps & chutes to minimize soil erosion. - Masonry retaining structures. - Formation of sediment basins & slope drains. - Maximum usage of material in fill areas. - Spoils planning particularly on steep slopes with bench terracing for high cut areas & avoidance of any erosion and runoff of material on down slopes - Planting grass and revegetation on disturbed areas and maintaining of landscaping.	04/10/2013	Y		
		12/10/2013	Y		
		18/10/2013	Y		
		27/10/2013	Y		
		05/11/2013	Y		
		14/11/2013	Y		
		20/11/2013	Y		
		29/11/2013	Y		
		07/12/2013	Y		
		15/12/2013	Y		
		21/12/2013	Y		
		30/12/2013	Y		

Environmental Impact/issue Contract/EMP ref	Mitigation Measures	Specific Date Item Monitored	Compliant	Remark	Follow-up actions needed
			Yes/No		
Use of Borrow Materials with potential for loss and degradation of land	<ul style="list-style-type: none"> <li>- No earth will be borrowed from cultivable and arable lands.</li> <li>- Borrowing to take place from barren, wastelands, &amp; riverbeds.</li> <li>- For new borrow areas, all measures will be taken to avoid loss of any productive soil.</li> <li>- Any borrow areas will be refilled, re-vegetated &amp; landscaped.</li> </ul>	04/10/2013	Y		
		12/10/2013	Y		
		18/10/2013	Y		
		27/10/2013	Y		
		05/11/2013	Y		
		14/11/2013	Y		
		20/11/2013	Y		
		29/11/2013	Y		
		07/12/2013	Y		
		15/12/2013	Y		
		21/12/2013	Y		
		30/12/2013	Y		
Taking of Quarry Materials with loss and degradation of land	<ul style="list-style-type: none"> <li>- Quarry materials will be obtained from existing operating sites with proper licenses &amp; environmental clearances.</li> <li>- New quarries to be opened only with permission of respective authorities.</li> </ul>	04/10/2013	Y		
		12/10/2013	Y		
		18/10/2013	Y		

Environmental Impact/issue Contract/EMP ref	Mitigation Measures	Specific Date Item Monitored	Compliant	Remark	Follow-up actions needed
			Yes/No		
		27/10/2013	Y		
		05/11/2013	Y		
		14/11/2013	Y		
		20/11/2013	Y		
		29/11/2013	Y		
		07/12/2013	Y		
		15/12/2013	Y		
		21/12/2013	Y		
		30/12/2013	Y		
Operation of construction equipment and construction activities and contamination of soils, loss of water quality & water pollution	<ul style="list-style-type: none"> <li>- Fuel storage &amp; refuelling will have adequate containment, away from water bodies/channel. Equipment will be properly maintained.</li> <li>- Precautions to be taken to prevent water pollution due to increased siltation &amp; turbidity for weir site &amp; road construction particularly in dry month when flows are low.</li> <li>- Approved sites defined for storage &amp; disposal of wastes materials</li> <li>- Any waste petroleum products will be collected, stored, &amp; disposed of at approved sites.</li> </ul>	04/10/2013	Y	There was much rocks on slopes of intake site after excavating (25 <sup>th</sup> April)	Require contractor to collect rocks
		12/10/2013	Y		
		18/10/2013	N		
		27/10/2013	Y		
		05/11/2013	N	Fuel storages were not aranged at approval site. The containment for storage & diposal of waste materials was	Require contractor to arrange fuel storage at approval site and rebuild the
		14/11/2013	Y		
		20/11/2013	Y		



Environmental Impact/issue Contract/EMP ref	Mitigation Measures	Specific Date Item Monitored	Compliant	Remark	Follow-up actions needed
			Yes/No		
		29/11/2013	Y	broken	containment for diposal waste.
		07/12/2013	Y		
		15/12/2013	Y		
		21/12/2013	Y		
		30/12/2013	Y		
Construction activities causing disruption of existing surface drains.	<ul style="list-style-type: none"> <li>- Appropriate rain-storm-water channels will be constructed.</li> <li>- Provision for cross drainage structures will be made.</li> </ul>	04/10/2013	Y		
		12/10/2013	Y		
		18/10/2013	Y		
		27/10/2013	Y		
		05/11/2013	Y		
		14/11/2013	Y		
		20/11/2013	Y		
		29/11/2013	Y		
		07/12/2013	Y		
		15/12/2013	Y		
		21/12/2013	Y		

Environmental Impact/issue Contract/EMP ref	Mitigation Measures	Specific Date Item Monitored	Compliant Yes/No	Remark	Follow-up actions needed
		30/12/2013	Y		
Construction Camp & Residential colony. Social impacts & pollution from wastewater & solid waste	<ul style="list-style-type: none"> <li>- Construction camps will be located adjoining the dam and powerhouse sites &amp; away from any settlement. Manual labour will be employed locally.</li> <li>- Camps &amp; residential colony will have properly designed sewage treatment system for wastewater effluent. Likewise, solid waste collection system will be employed.</li> </ul>	04/10/2013	Y	There are many packs of cigarettes around the camps site	Require contractor to collect waste around the camps site
		12/10/2013	Y		
		18/10/2013	Y		
		27/10/2013	Y		
		05/11/2013	N		
		14/11/2013	Y		
		20/11/2013	Y		
		29/11/2013	Y		
		07/12/2013	Y		
		15/12/2013	Y		
		21/12/2013	Y		
		30/12/2013	Y		
Emission from Construction Vehicles & Equipment causing	<ul style="list-style-type: none"> <li>- Emission levels of all construction vehicles &amp; equipment will conform to Vietnamese emission standards.</li> <li>- Pollutant parameters will be monitored during construction.</li> </ul>	04/10/2013	Y		
		12/10/2013	Y		

Environmental Impact/issue Contract/EMP ref	Mitigation Measures	Specific Date Item Monitored	Compliant	Remark	Follow-up actions needed
			Yes/No		
air pollution	- Crushing, & concrete plants will be away from population centres at dam and powerhouse sites.	18/10/2013	Y		
		27/10/2013	Y		
		05/11/2013	Y		
		14/11/2013	Y		
		20/11/2013	Y		
		29/11/2013	Y		
		07/12/2013	Y		
		15/12/2013	Y		
		21/12/2013	Y		
		30/12/2013	Y		
Dust particulates causing health impacts for workers and villagers	<ul style="list-style-type: none"> <li>- All precautions to be taken to reduce dust level emissions from batching plants &amp; portable crushers at dam and powerhouse sites.</li> <li>- Regular water spraying at all mixing sites &amp; temporary service roads will be undertaken.</li> <li>- All delivery vehicles will be covered with tarpaulin.</li> </ul>	04/10/2013	Y		
		12/10/2013	Y		
		18/10/2013	Y		
		27/10/2013	Y		
		05/11/2013	Y		
		14/11/2013	Y		

Environmental Impact/issue Contract/EMP ref	Mitigation Measures	Specific Date Item Monitored	Compliant	Remark	Follow-up actions needed
			Yes/No		
		20/11/2013	Y		Require contractor to cover delivery vehicles
		29/11/2013	Y		
		07/12/2013	N		
		15/12/2013	Y		
		21/12/2013	Y		
		30/12/2013	Y		
Construction activity Noise from Vehicles, Plant & Equipment causing noise pollution	<ul style="list-style-type: none"> <li>- All construction equipment &amp; plants will conform to Vietnamese noise standards.</li> <li>- All vehicles &amp; equipment to be fitted with noise abatement devices.</li> <li>- Construction workers will be provided with personal protection.</li> </ul>	04/10/2013	Y		
		12/10/2013	Y		
		18/10/2013	Y		
		27/10/2013	Y		
		05/11/2013	Y		
		14/11/2013	Y		
		20/11/2013	Y		
		29/11/2013	Y		
		07/12/2013	Y		
		15/12/2013	Y		
		21/12/2013	Y		
		30/12/2013	Y		
Noise pollution from any blasting	- Any blasting works will be in accordance with Vietnamese Explosives Act.	04/10/2013	Y		

Environmental Impact/issue Contract/EMP ref activities at dam and power tunnel and penstock,	Mitigation Measures	Specific Date Item Monitored	Compliant	Remark	Follow-up actions needed
			Yes/No		
	<ul style="list-style-type: none"> <li>- No blasting between dusk &amp; dawn.</li> <li>- Residents close by will be informed well in advance of blasting times.</li> <li>- Workers associated with blasting sites will be provided with earplugs, helmets &amp; other personal safety devices.</li> </ul>	12/10/2013	Y		
		18/10/2013	Y		
		27/10/2013	Y		
		05/11/2013	Y		
		14/11/2013	Y		
		20/11/2013	Y		
		29/11/2013	Y		
		07/12/2013	Y		
		15/12/2013	Y		
		21/12/2013	Y		
		30/12/2013	Y		
Construction of dam, reservoir, tunnel, penstock with loss of	<ul style="list-style-type: none"> <li>- No trees to be removed without prior approval,</li> <li>- Compensation for lost trees on private land,</li> <li>- Planting grass and maintaining</li> </ul>	04/10/2013	Y		
		12/10/2013	Y		

Environmental Impact/issue Contract/EMP ref vegetation & tree cover.	Mitigation Measures	Specific Date Item Monitored	Compliant Yes/No	Remark	Follow-up actions needed
	- Tree plantation implemented at dam area, tunnel, penstock, temporary construction areas, roads and other elements of the project. Indigenous tree species being accorded priority over exotic species such as: Acacia Aurculiformis A.Cunn.ex Benth	18/10/2013	Y		
		27/10/2013	Y		
		05/11/2013	Y		
		14/11/2013	Y		
		20/11/2013	Y		
		29/11/2013	Y		
		07/12/2013	Y		
		15/12/2013	Y		
		21/12/2013	Y		
		30/12/2013	Y		
Work force during construction causing impacts to wildlife	- Construction workers to be educated for wildlife conservation with no hunting & poaching to be allowed for workers.	04/10/2013	Y		
		12/10/2013	Y		
		18/10/2013	Y		
		27/10/2013	Y		
		05/11/2013	Y		
		14/11/2013	Y		
		20/11/2013	Y		
		29/11/2013	Y		

Environmental Impact/issue Contract/EMP ref	Mitigation Measures	Specific Date Item Monitored	Compliant	Remark	Follow-up actions needed
			Yes/No		
Construction Activities & Accident Risks	<ul style="list-style-type: none"> <li>- All blasting sites will have warning &amp; clearance signals. Site will be inspected prior/after blasting.</li> <li>- Workers will be provided with helmets, masks, safety goggles, etc.</li> <li>- A readily available first aid unit will be available with dressing materials etc.</li> <li>- Road safety education will be given to construction vehicle drivers.</li> <li>- Traffic management will be ensured during road construction periods.</li> <li>- Information dissemination will take place through the Commune's People Committee regarding activities causing disruption.</li> </ul>	07/12/2013	Y		
		15/12/2013	Y		
		21/12/2013	Y		
		30/12/2013	Y		
		04/10/2013	Y	Some of workers did not wear helmets	Require contractor to wear full of protection personal
		12/10/2013	Y		
		18/10/2013	Y		
		27/10/2013	Y		
		05/11/2013	Y		
		14/11/2013	Y		
		20/11/2013	Y		
		29/11/2013	Y		

Environmental Impact/issue Contract/EMP ref	Mitigation Measures	Specific Date Item Monitored	Compliant	Remark	Follow-up actions needed
			Yes/No		
		07/12/2013	Y	Some of workers did not wear protection personal	Require contractor to provide full of protection personal
		15/12/2013	N		
		21/12/2013	Y		
		30/12/2013	Y		
Construction Activities causing disruption to Public Utilities	- Any public utilities likely to be impacted, such as water supply pipe system, power/phone lines etc. must be relocated to suitable places, in consultation with local beneficiaries.	04/10/2013	Y		
		12/10/2013	Y		
		18/10/2013	Y		
		27/10/2013	Y		
		05/11/2013	Y		
		14/11/2013	Y		
		20/11/2013	Y		
		29/11/2013	Y		
		07/12/2013	Y		
		15/12/2013	Y		



Environmental Impact/issue Contract/EMP ref	Mitigation Measures	Specific Date Item Monitored	Compliant	Remark	Follow-up actions needed
			Yes/No		
		21/12/2013	Y		
		30/12/2013	Y		
Any discovery of artifacts or articles of historical interest and importance	- For all finds of an historical or cultural value, work will be stopped and the find reported to the nearest office of the Department Culture, Sport and Tourism or the Department of Culture and Information	04/10/2013	Y		
		12/10/2013	Y		
		18/10/2013	Y		
		27/10/2013	Y		
		05/11/2013	Y		
		14/11/2013	Y		
		20/11/2013	Y		
		29/11/2013	Y		
		07/12/2013	Y		
		15/12/2013	Y		
		21/12/2013	Y		
		30/12/2013	Y		

Supervisor  
Signed  
Doan Van So

### Environmental Monitoring Checklist 5

PROJECT: A Roang Hydropower Plant

MONITOR NAME: Central Rural Electric Project Management Board

CONTRACTOR NAME: Consulting construction & power development JSC (Responsible for Package 20-AR: Construction of tunnel)

MONITORING TIMING: July - September 2013

WEATHER CONDITIONS: Bad

Environmental Impact/issue Contract/EMP ref	Mitigation Measures	Specific Date Item Monitored	Compliant	Remark	Follow-up actions needed
			Yes/No		
Construction stage					
Earthworks for new access roads and construction of penstock on steep slopes leading to erosion & encroachment	Slopes along access roads & penstock will be provided with: - Catchments/ cut-off drains, silt traps & chutes to minimize soil erosion. - Masonry retaining structures. - Formation of sediment basins & slope drains. - Maximum usage of material in fill areas. - Spoils planning particularly on steep slopes with bench terracing for high cut areas & avoidance of any erosion and runoff of material on down slopes - Planting grass and revegetation on disturbed areas and maintaining of landscaping.	03/07/2013	Y	contractor disposed of waste to river	Require contractor to dispose of to approval site
		14/07/2013	Y		
		23/07/2013	Y		
		31/07/2013	Y		
		07/08/2013	Y		
		15/08/2013	Y		
		21/08/2013	Y		
		30/08/2013	Y		
		05/09/2013	Y		
		12/09/2013	Y		
		20/09/2013	Y		
		28/09/2013	Y		

Environmental Impact/issue Contract/EMP ref	Mitigation Measures	Specific Date Item Monitored	Compliant	Remark	Follow-up actions needed
			Yes/No		
Use of Borrow Materials with potential for loss and degradation of land	<ul style="list-style-type: none"> <li>- No earth will be borrowed from cultivable and arable lands.</li> <li>- Borrowing to take place from barren, wastelands, &amp; riverbeds.</li> <li>- For new borrow areas, all measures will be taken to avoid loss of any productive soil.</li> <li>- Any borrow areas will be refilled, re-vegetated &amp; landscaped.</li> </ul>	03/07/2013	Y		
		14/07/2013	Y		
		23/07/2013	Y		
		31/07/2013	Y		
		07/08/2013	Y		
		15/08/2013	Y		
		21/08/2013	Y		
		30/08/2013	Y		
		05/09/2013	Y		
		12/09/2013	Y		
		20/09/2013	Y		
		28/09/2013	Y		
Taking of Quarry Materials with loss and degradation of land	<ul style="list-style-type: none"> <li>- Quarry materials will be obtained from existing operating sites with proper licenses &amp; environmental clearances.</li> <li>- New quarries to be opened only with permission of respective authorities.</li> </ul>	03/07/2013	Y	Contractor bought materials in A Luoi district	
		14/07/2013	Y		
		23/07/2013	Y		

Environmental Impact/issue Contract/EMP ref	Mitigation Measures	Specific Date Item Monitored	Compliant	Remark	Follow-up actions needed
			Yes/No		
		31/07/2013	Y		
		07/08/2013	Y		
		15/08/2013	Y		
		21/08/2013	Y		
		30/08/2013	Y		
		05/09/2013	Y		
		12/09/2013	Y		
		20/09/2013	Y		
		28/09/2013	Y		
Operation of construction equipment and construction activities and contamination of soils, loss of water quality & water pollution	<ul style="list-style-type: none"> <li>- Fuel storage &amp; refuelling will have adequate containment, away from water bodies/channel. Equipment will be properly maintained.</li> <li>- Precautions to be taken to prevent water pollution due to increased siltation &amp; turbidity for weir site &amp; road construction particularly in dry month when flows are low.</li> <li>- Approved sites defined for storage &amp; disposal of wastes materials</li> <li>- Any waste petroleum products will be collected, stored, &amp; disposed of at approved sites.</li> </ul>	03/07/2013	Y		Require contractor to build diposal system at approval site
		14/07/2013	Y		
		23/07/2013	Y		
		31/07/2013	Y		
		07/08/2013	Y	Contractor started living in the camps	Require contractor to build diposal system soon
		15/08/2013	Y		
		21/08/2013	Y		

Environmental Impact/issue Contract/EMP ref	Mitigation Measures	Specific Date Item Monitored	Compliant	Remark	Follow-up actions needed
			Yes/No		
		30/08/2013	Y		
		05/09/2013	Y		
		12/09/2013	Y		
		20/09/2013	Y		
		28/09/2013	Y		
Construction activities causing disruption of existing surface drains.	<ul style="list-style-type: none"> <li>- Appropriate rain-storm-water channels will be constructed.</li> <li>- Provision for cross drainage structures will be made.</li> </ul>	03/07/2013	Y		
		14/07/2013	Y		
		23/07/2013	Y		
		31/07/2013	Y		
		07/08/2013	Y		
		15/08/2013	Y		
		21/08/2013	Y		
		30/08/2013	Y		
		05/09/2013	Y		
		12/09/2013	Y		
		20/09/2013	Y		
		28/09/2013	Y		

Environmental Impact/issue Contract/EMP ref	Mitigation Measures	Specific Date Item Monitored	Compliant	Remark	Follow-up actions needed
			Yes/No		
Construction Camp & Residential colony. Social impacts & pollution from wastewater & solid waste	<ul style="list-style-type: none"> <li>- Construction camps will be located adjoining the dam and powerhouse sites &amp; away from any settlement. Manual labour will be employed locally.</li> <li>- Camps &amp; residential colony will have properly designed sewage treatment system for wastewater effluent. Likewise, solid waste collection system will be employed.</li> </ul>	03/07/2013	N	Contractor had not lived at camps	Require contractor to build toilet of camps soon
		14/07/2013	N		
		23/07/2013	Y		
		31/07/2013	Y		
		07/08/2013	Y	Contractor built toilet without septic tank	Require contractor to provide septic tank
		15/08/2013	N		
		21/08/2013	N		
		30/08/2013	N		
		05/09/2013	Y		
		12/09/2013	Y		
		20/09/2013	Y		
		28/09/2013	Y		
Emission from Construction Vehicles & Equipment causing	<ul style="list-style-type: none"> <li>- Emission levels of all construction vehicles &amp; equipment will conform to Vietnamese emission standards.</li> <li>- Pollutant parameters will be monitored during construction.</li> </ul>	03/07/2013	Y		
		14/07/2013	Y		

Environmental Impact/issue Contract/EMP ref	Mitigation Measures	Specific Date Item Monitored	Compliant	Remark	Follow-up actions needed
			Yes/No		
air pollution	- Crushing, & concrete plants will be away from population centres at dam and powerhouse sites.	23/07/2013	Y		
		31/07/2013	Y		
		07/08/2013	Y		
		15/08/2013	Y		
		21/08/2013	Y		
		30/08/2013	Y		
		05/09/2013	Y		
		12/09/2013	Y		
		20/09/2013	Y		
		28/09/2013	Y		
Dust particulates causing health impacts for workers and villagers	<ul style="list-style-type: none"> <li>- All precautions to be taken to reduce dust level emissions from batching plants &amp; portable crushers at dam and powerhouse sites.</li> <li>- Regular water spraying at all mixing sites &amp; temporary service roads will be undertaken.</li> <li>- All delivery vehicles will be covered with tarpaulin.</li> </ul>	03/07/2013	Y		
		14/07/2013	Y		
		23/07/2013	Y		
		31/07/2013	Y		
		07/08/2013	Y		
		15/08/2013	Y		

Environmental Impact/issue Contract/EMP ref	Mitigation Measures	Specific Date Item Monitored	Compliant	Remark	Follow-up actions needed
			Yes/No		
		21/08/2013	Y		
		30/08/2013	Y		
		05/09/2013	Y		
		12/09/2013	Y		
		20/09/2013	Y		
		28/09/2013	Y		
Construction activity Noise from Vehicles, Plant & Equipment causing noise pollution	<ul style="list-style-type: none"> <li>- All construction equipment &amp; plants will conform to Vietnamese noise standards.</li> <li>- All vehicles &amp; equipment to be fitted with noise abatement devices.</li> <li>- Construction workers will be provided with personal protection.</li> </ul>	03/07/2013	Y		
		14/07/2013	Y		
		23/07/2013	Y		
		31/07/2013	Y		
		07/08/2013	Y		
		15/08/2013	Y		
		21/08/2013	Y		
		30/08/2013	Y		
		05/09/2013	Y		
		12/09/2013	Y		
		20/09/2013	Y		
		28/09/2013	Y		
Noise pollution from any blasting	- Any blasting works will be in accordance with Vietnamese Explosives Act.	03/07/2013	Y	There was not done blasting in	



Environmental Impact/issue Contract/EMP ref activities at dam and power tunnel and penstock,	Mitigation Measures	Specific Date Item Monitored	Compliant	Remark	Follow-up actions needed
			Yes/No		
	<ul style="list-style-type: none"> <li>- No blasting between dusk &amp; dawn.</li> <li>- Residents close by will be informed well in advance of blasting times.</li> <li>- Workers associated with blasting sites will be provided with earplugs, helmets &amp; other personal safety devices.</li> </ul>	14/07/2013	Y	this period, contractor was building containment for explosives	
		23/07/2013	Y		
		31/07/2013	Y		
		07/08/2013	Y		
		15/08/2013	Y		
		21/08/2013	Y		
		30/08/2013	Y		
		05/09/2013	Y		
		12/09/2013	Y		
		20/09/2013	Y		
		28/09/2013	Y		
Construction of dam, reservoir, tunnel, penstock with loss of	<ul style="list-style-type: none"> <li>- No trees to be removed without prior approval,</li> <li>- Compensation for lost trees on private land,</li> <li>- Planting grass and maintaining</li> </ul>	03/07/2013	Y		
		14/07/2013	Y		

Environmental Impact/issue Contract/EMP ref vegetation & tree cover.	Mitigation Measures	Specific Date Item Monitored	Compliant	Remark	Follow-up actions needed
			Yes/No		
-	Tree plantation implemented at dam area, tunnel, penstock, temporary construction areas, roads and other elements of the project. Indigenous tree species being accorded priority over exotic species such as: <i>Acacia Aurculiformis</i> A.Cunn.ex Benth	23/07/2013	Y		
		31/07/2013	Y		
		07/08/2013	Y		
		15/08/2013	Y		
		21/08/2013	Y		
		30/08/2013	Y		
		05/09/2013	Y		
		12/09/2013	Y		
		20/09/2013	Y		
		28/09/2013	Y		
Work force during construction causing impacts to wildlife	- Construction workers to be educated for wildlife conservation with no hunting & poaching to be allowed for workers.	03/07/2013	Y		
		14/07/2013	Y		
		23/07/2013	Y		
		31/07/2013	Y		
		07/08/2013	Y		
		15/08/2013	Y		
		21/08/2013	Y		
		30/08/2013	Y		

Environmental Impact/issue Contract/EMP ref	Mitigation Measures	Specific Date Item Monitored	Compliant	Remark	Follow-up actions needed
			Yes/No		
Construction Activities & Accident Risks	<ul style="list-style-type: none"> <li>- All blasting sites will have warning &amp; clearance signals. Site will be inspected prior/after blasting.</li> <li>- Workers will be provided with helmets, masks, safety goggles, etc.</li> <li>- A readily available first aid unit will be available with dressing materials etc.</li> <li>- Road safety education will be given to construction vehicle drivers.</li> <li>- Traffic management will be ensured during road construction periods.</li> <li>- Information dissemination will take place through the Commune's People Committee regarding activities causing disruption.</li> </ul>	05/09/2013	Y		
		12/09/2013	Y		
		20/09/2013	Y		
		28/09/2013	Y		
		03/07/2013	N	Some of workers did not wear helmets	. Require workers to wear helmets
		14/07/2013	N		
		23/07/2013	N		
		31/07/2013	Y		
		03/07/2013	Y	Contractor did not provide first-aid kit. Some of workers did not wear helmets	Require contractor to provide first-aid kit. Require workers to wear helmets
		14/07/2013	N		
		23/07/2013	Y		
		31/07/2013	Y		

Environmental Impact/issue Contract/EMP ref	Mitigation Measures	Specific Date Item Monitored	Compliant	Remark	Follow-up actions needed
			Yes/No		
		07/08/2013	Y		
		15/08/2013	Y		
		21/08/2013	Y		
		30/08/2013	Y		
Construction Activities causing disruption to Public Utilities	- Any public utilities likely to be impacted, such as water supply pipe system, power/phone lines etc. must be relocated to suitable places, in consultation with local beneficiaries.	03/07/2013	Y		
		14/07/2013	Y		
		23/07/2013	Y		
		31/07/2013	Y		
		07/08/2013	Y		
		15/08/2013	Y		
		21/08/2013	Y		
		30/08/2013	Y		
		05/09/2013	Y		
		12/09/2013	Y		

Environmental Impact/issue Contract/EMP ref	Mitigation Measures	Specific Date Item Monitored	Compliant	Remark	Follow-up actions needed
			Yes/No		
		20/09/2013	Y		
		28/09/2013	Y		
Any discovery of artifacts or articles of historical interest and importance	- For all finds of an historical or cultural value, work will be stopped and the find reported to the nearest office of the Department Culture, Sport and Tourism or the Department of Culture and Information	03/07/2013	Y		
		14/07/2013	Y		
		23/07/2013	Y		
		31/07/2013	Y		
		07/08/2013	Y		
		15/08/2013	Y		
		21/08/2013	Y		
		30/08/2013	Y		
		05/09/2013	Y		
		12/09/2013	Y		
		20/09/2013	Y		
		28/09/2013	Y		

### Environmental Monitoring Checklist 6

PROJECT: A Roang Hydropower Plant

MONITOR NAME: Central Rural Electric Project Management Board

CONTRACTOR NAME: Consulting construction & power development JSC (Responsible for Package 20-AR: Construction of tunnel)

MONITORING TIMING: October – December 2013

WEATHER CONDITIONS: Bad

Environmental Impact/issue Contract/EMP ref	Mitigation Measures	Specific Date Item Monitored	Compliant	Remark	Follow-up actions needed
			Yes/No		
Construction stage					
Earthworks for new access roads and construction of penstock on steep slopes leading to erosion & encroachment	Slopes along access roads & penstock will be provided with: - Catchments/ cut-off drains, silt traps & chutes to minimize soil erosion. - Masonry retaining structures. - Formation of sediment basins & slope drains. - Maximum usage of material in fill areas. - Spoils planning particularly on steep slopes with bench terracing for high cut areas & avoidance of any erosion and runoff of material on down slopes - Planting grass and revegetation on disturbed areas and maintaining of landscaping.	04/10/2013	Y		
		11/10/2013	Y		
		19/10/2013	Y		
		27/10/2013	Y		
		06/11/2013	Y		
		10/11/2013	Y		
		20/11/2013	Y		
		29/11/2013	Y		
		07/12/2013	Y		
		14/12/2013	Y		
		22/12/2013	Y		
		30/12/2013	Y		

Environmental Impact/issue Contract/EMP ref	Mitigation Measures	Specific Date Item Monitored	Compliant	Remark	Follow-up actions needed
			Yes/No		
Use of Borrow Materials with potential for loss and degradation of land	<ul style="list-style-type: none"> <li>- No earth will be borrowed from cultivable and arable lands.</li> <li>- Borrowing to take place from barren, wastelands, &amp; riverbeds.</li> <li>- For new borrow areas, all measures will be taken to avoid loss of any productive soil.</li> <li>- Any borrow areas will be refilled, re-vegetated &amp; landscaped.</li> </ul>	04/10/2013	Y		
		11/10/2013	Y		
		19/10/2013	Y		
		27/10/2013	Y		
		06/11/2013	Y		
		10/11/2013	Y		
		20/11/2013	Y		
		29/11/2013	Y		
		07/12/2013	Y		
		14/12/2013	Y		
		22/12/2013	Y		
		30/12/2013	Y		
Taking of Quarry Materials with loss and degradation of land	<ul style="list-style-type: none"> <li>- Quarry materials will be obtained from existing operating sites with proper licenses &amp; environmental clearances.</li> <li>- New quarries to be opened only with permission of respective authorities.</li> </ul>	04/10/2013	Y		
		11/10/2013	Y		
		19/10/2013	Y		

Environmental Impact/issue Contract/EMP ref	Mitigation Measures	Specific Date Item Monitored	Compliant	Remark	Follow-up actions needed
			Yes/No		
		27/10/2013	Y		
		06/11/2013	Y		
		10/11/2013	Y		
		20/11/2013	Y		
		29/11/2013	Y		
		07/12/2013	Y		
		14/12/2013	Y		
		22/12/2013	Y		
		30/12/2013	Y		
Operation of construction equipment and construction activities and contamination of soils, loss of water quality & water pollution	<ul style="list-style-type: none"> <li>- Fuel storage &amp; refuelling will have adequate containment, away from water bodies/channel. Equipment will be properly maintained.</li> <li>- Precautions to be taken to prevent water pollution due to increased siltation &amp; turbidity for weir site &amp; road construction particularly in dry month when flows are low.</li> <li>- Approved sites defined for storage &amp; disposal of wastes materials</li> <li>- Any waste petroleum products will be collected, stored, &amp; disposed of at approved sites.</li> </ul>	04/10/2013	Y		
		11/10/2013	Y		
		19/10/2013	N		
		27/10/2013	Y		
		06/11/2013	N		
		10/11/2013	Y		
		20/11/2013	Y		



Environmental Impact/issue Contract/EMP ref	Mitigation Measures	Specific Date Item Monitored	Compliant Yes/No	Remark	Follow-up actions needed
		29/11/2013	Y		
		07/12/2013	Y		
		14/12/2013	Y		
		22/12/2013	Y		
		30/12/2013	Y		
Construction activities causing disruption of existing surface drains.	<ul style="list-style-type: none"> <li>- Appropriate rain-storm-water channels will be constructed.</li> <li>- Provision for cross drainage structures will be made.</li> </ul>	04/10/2013	Y		
		11/10/2013	Y		
		19/10/2013	Y		
		27/10/2013	Y		
		06/11/2013	Y		
		10/11/2013	Y		
		20/11/2013	Y		
		29/11/2013	Y		
		07/12/2013	Y		
		14/12/2013	Y		
		22/12/2013	Y		
		30/12/2013	Y		

Environmental Impact/issue Contract/EMP ref	Mitigation Measures	Specific Date Item Monitored	Compliant	Remark	Follow-up actions needed
			Yes/No		
Construction Camp & Residential colony. Social impacts & pollution from wastewater & solid waste	<ul style="list-style-type: none"> <li>- Construction camps will be located adjoining the dam and powerhouse sites &amp; away from any settlement. Manual labour will be employed locally.</li> <li>- Camps &amp; residential colony will have properly designed sewage treatment system for wastewater effluent. Likewise, solid waste collection system will be employed.</li> </ul>	04/10/2013	Y	Contractor did not provide toilet and septic tanks at surge tank site	Require contractor to provide toilet and septic tank
		11/10/2013	Y		
		19/10/2013	N		
		27/10/2013	Y		
		06/11/2013	N	Contractor did not provide toilet and septic tanks at surge tank site	Require contractor to provide toilet and septic tank
		10/11/2013	Y		
		20/11/2013	Y		
		29/11/2013	Y		
		07/12/2013	Y		
		14/12/2013	Y		
		22/12/2013	Y		
		30/12/2013	Y		
Emission from Construction Vehicles & Equipment causing	<ul style="list-style-type: none"> <li>- Emission levels of all construction vehicles &amp; equipment will conform to Vietnamese emission standards.</li> <li>- Pollutant parameters will be monitored during construction.</li> </ul>	04/10/2013	Y		
		11/10/2013	Y		

Environmental Impact/issue Contract/EMP ref	Mitigation Measures	Specific Date Item Monitored	Compliant	Remark	Follow-up actions needed
			Yes/No		
air pollution	- Crushing, & concrete plants will be away from population centres at dam and powerhouse sites.	19/10/2013	Y		
		27/10/2013	Y		
		06/11/2013	Y		
		10/11/2013	Y		
		20/11/2013	Y		
		29/11/2013	Y		
		07/12/2013	Y		
		14/12/2013	Y		
		22/12/2013	Y		
		30/12/2013	Y		
Dust particulates causing health impacts for workers and villagers	<ul style="list-style-type: none"> <li>- All precautions to be taken to reduce dust level emissions from batching plants &amp; portable crushers at dam and powerhouse sites.</li> <li>- Regular water spraying at all mixing sites &amp; temporary service roads will be undertaken.</li> <li>- All delivery vehicles will be covered with tarpaulin.</li> </ul>	04/10/2013	Y	Pit of surge tank is far from residents area , distance from pit to diposal area is about 30-100m	
		11/10/2013	Y		
		19/10/2013	Y		
		27/10/2013	Y		
		06/11/2013	Y		
		10/11/2013	Y		

Environmental Impact/issue Contract/EMP ref	Mitigation Measures	Specific Date Item Monitored	Compliant	Remark	Follow-up actions needed
			Yes/No		
		20/11/2013	Y		
		29/11/2013	Y		
		07/12/2013	N		
		14/12/2013	Y		
		22/12/2013	Y		
		30/12/2013	Y		
Construction activity Noise from Vehicles, Plant & Equipment causing noise pollution	<ul style="list-style-type: none"> <li>- All construction equipment &amp; plants will conform to Vietnamese noise standards.</li> <li>- All vehicles &amp; equipment to be fitted with noise abatement devices.</li> <li>- Construction workers will be provided with personal protection.</li> </ul>	04/10/2013	Y		
		11/10/2013	Y		
		19/10/2013	Y		
		27/10/2013	Y		
		06/11/2013	Y		
		10/11/2013	Y		
		20/11/2013	Y		
		29/11/2013	Y		
		07/12/2013	Y		
		14/12/2013	Y		
		22/12/2013	Y		
		30/12/2013	Y		
Noise pollution from any blasting	- Any blasting works will be in accordance with Vietnamese Explosives Act.	04/10/2013	Y		

Environmental Impact/issue Contract/EMP ref activities at dam and power tunnel and penstock,	Mitigation Measures	Specific Date Item Monitored	Compliant	Remark	Follow-up actions needed
			Yes/No		
	<ul style="list-style-type: none"> <li>- No blasting between dusk &amp; dawn.</li> <li>- Residents close by will be informed well in advance of blasting times.</li> <li>- Workers associated with blasting sites will be provided with earplugs, helmets &amp; other personal safety devices.</li> </ul>	11/10/2013	Y		
		19/10/2013	Y		
		27/10/2013	Y		
		06/11/2013	Y		
		10/11/2013	Y		
		20/11/2013	Y		
		29/11/2013	Y		
		07/12/2013	Y	Some of workers did not wear protection personal	Require contractor to provide protection personal for workers
		14/12/2013	Y		
		22/12/2013	Y		
		30/12/2013	Y		
Construction of dam, reservoir, tunnel, penstock with loss of	<ul style="list-style-type: none"> <li>- No trees to be removed without prior approval,</li> <li>- Compensation for lost trees on private land,</li> <li>- Planting grass and maintaining</li> </ul>	04/10/2013	Y		
		11/10/2013	Y		

Environmental Impact/issue Contract/EMP ref vegetation & tree cover.	Mitigation Measures	Specific Date Item Monitored	Compliant Yes/No	Remark	Follow-up actions needed
	- Tree plantation implemented at dam area, tunnel, penstock, temporary construction areas, roads and other elements of the project. Indigenous tree species being accorded priority over exotic species such as: Acacia Aurculiformis A.Cunn.ex Benth	19/10/2013	Y		
		27/10/2013	Y		
		06/11/2013	Y		
		10/11/2013	Y		
		20/11/2013	Y		
		29/11/2013	Y		
		07/12/2013	Y		
		14/12/2013	Y		
		22/12/2013	Y		
		30/12/2013	Y		
Work force during construction causing impacts to wildlife	- Construction workers to be educated for wildlife conservation with no hunting & poaching to be allowed for workers.	04/10/2013	Y		
		11/10/2013	Y		
		19/10/2013	Y		
		27/10/2013	Y		
		06/11/2013	Y		
		10/11/2013	Y		
		20/11/2013	Y		
		29/11/2013	Y		

Environmental Impact/issue Contract/EMP ref	Mitigation Measures	Specific Date Item Monitored	Compliant	Remark	Follow-up actions needed
			Yes/No		
		07/12/2013	Y		
		14/12/2013	Y		
		22/12/2013	Y		
		30/12/2013	Y		
Construction Activities & Accident Risks	<ul style="list-style-type: none"> <li>- All blasting sites will have warning &amp; clearance signals. Site will be inspected prior/after blasting.</li> <li>- Workers will be provided with helmets, masks, safety goggles, etc.</li> <li>- A readily available first aid unit will be available with dressing materials etc.</li> <li>- Road safety education will be given to construction vehicle drivers.</li> <li>- Traffic management will be ensured during road construction periods.</li> <li>- Information dissemination will take place through the Commune's People Committee regarding activities causing disruption.</li> </ul>	04/10/2013	Y		
		11/10/2013	Y		
		19/10/2013	Y		
		27/10/2013	Y		
		06/11/2013	Y		
		10/11/2013	Y		
		20/11/2013	Y		
		29/11/2013	Y		

Environmental Impact/issue Contract/EMP ref	Mitigation Measures	Specific Date Item Monitored	Compliant	Remark	Follow-up actions needed
			Yes/No		
		07/12/2013	Y		
		14/12/2013	N		
		22/12/2013	Y		
		30/12/2013	Y		
Construction Activities causing disruption to Public Utilities	- Any public utilities likely to be impacted, such as water supply pipe system, power/phone lines etc. must be relocated to suitable places, in consultation with local beneficiaries.	04/10/2013	Y		
		11/10/2013	Y		
		19/10/2013	Y		
		27/10/2013	Y		
		06/11/2013	Y		
		10/11/2013	Y		
		20/11/2013	Y		
		29/11/2013	Y		
		07/12/2013	Y		
		14/12/2013	Y		



Environmental Impact/issue Contract/EMP ref	Mitigation Measures	Specific Date Item Monitored	Compliant Yes/No	Remark	Follow-up actions needed
		22/12/2013	Y		
		30/12/2013	Y		
Any discovery of artifacts or articles of historical interest and importance	- For all finds of an historical or cultural value, work will be stopped and the find reported to the nearest office of the Department Culture, Sport and Tourism or the Department of Culture and Information	04/10/2013	Y		
		11/10/2013	Y		
		19/10/2013	Y		
		27/10/2013	Y		
		06/11/2013	Y		
		10/11/2013	Y		
		20/11/2013	Y		
		29/11/2013	Y		
		07/12/2013	Y		
		14/12/2013	Y		
		22/12/2013	Y		
		30/12/2013	Y		

Supervisor

Signed  
Nguyen Thanh Minh

**Appendix 3:****Certificate of Registration of Environmental Protection Commitment for A Roang Hydropower Project**

ỦY BAN NHÂN DÂN  
HUYỆN A LƯỢI  
Số 07 /GXN - UBND

CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM  
Độc lập - Tự do - Hạnh phúc  
A Lười, ngày 24 tháng 6 năm 2010

**GIẤY XÁC NHẬN ĐĂNG KÝ  
BẢN CAM KẾT BẢO VỆ MÔI TRƯỜNG  
Của Dự án nhà máy thủy điện A Roang**

Căn cứ Luật Tổ chức Hội đồng Nhân dân và Ủy ban Nhân dân ngày 26 tháng 11 năm 2003;

Căn cứ Luật Bảo vệ môi trường ngày 29 tháng 11 năm 2005;

Căn cứ Nghị định số 80/2006/NĐ-CP ngày 09 tháng 8 năm 2006 của Chính phủ về việc Quy định chi tiết và hướng dẫn thi hành một số điều của Luật Bảo vệ môi trường;

Căn cứ Nghị định số 21/2008/NĐ-CP ngày 28 tháng 02 năm 2008 của Chính phủ về sửa đổi, bổ sung một số điều của Nghị định số 80/2006/NĐ-CP ngày 09 tháng 8 năm 2006 của Chính phủ về việc quy định chi tiết và hướng dẫn thi hành một số điều của Luật Bảo vệ môi trường;

Căn cứ Thông tư số 05/2008/TT-BTNMT ngày 08 tháng 12 năm 2008 của Bộ Tài nguyên và Môi trường hướng dẫn về đánh giá môi trường chiến lược, đánh giá tác động môi trường và cam kết bảo vệ môi trường;

Theo đề nghị của Trưởng Phòng Tài nguyên và Môi trường,

**ỦY BAN NHÂN DÂN HUYỆN XÁC NHẬN:**

**Điều 1.** Chủ dự án là Ban quản lý dự án năng lượng nông thôn khu vực miền Trung đã có công văn số 1145/DANT-TĐ ngày 7 tháng 4 năm 2010 về việc đề nghị xác nhận đăng ký bản cam kết bảo vệ môi trường dự án nhà máy thủy điện A Roang.

**Điều 2.** Chủ Dự án có trách nhiệm thực hiện đúng và đầy đủ những nội dung về bảo vệ môi trường nêu trong bản cam kết bảo vệ môi trường và những yêu cầu bắt buộc sau đây:

1. Phải lập, đăng ký và xác nhận bản cam kết bảo vệ môi trường bổ sung:

Khi dự án có một trong những thay đổi cơ bản về công nghệ hoặc quy mô, công suất hoặc địa điểm thực hiện; trường hợp việc thay đổi địa điểm của dự án xảy ra đồng thời với việc thay đổi cơ quan có thẩm quyền xác nhận, chủ dự án phải lập lại hồ sơ đăng ký bản cam kết bảo vệ môi trường;

2. Bản cam kết bảo vệ môi trường bổ sung phải được thể hiện theo đúng cấu trúc và đáp ứng yêu cầu về nội dung theo quy định tại Phụ lục 28 ban hành kèm theo Thông tư số 05/2008/TT-BTNMT ngày 08 tháng 12 năm 2008 của Bộ Tài nguyên và Môi trường hướng dẫn về đánh giá môi trường chiến lược, đánh giá tác động môi trường và cam kết bảo vệ môi trường.

3. Khi cần thiết sử dụng nước ngầm bằng giếng khoan phải chấp hành nghiêm Luật Tài nguyên nước số 08/1998/QH10 ngày 20 tháng 5 năm 1998; Quyết định số 84/2008/QĐ-UBND ngày 11 tháng 01 năm 2008 của Ủy ban Nhân dân tỉnh Thừa Thiên

Huế về việc ban hành Quy định về quản lý, sử dụng, bảo vệ tài nguyên nước và xả nước thải vào nguồn nước trên địa bàn tỉnh.

4. Bổ sung vào bản cam kết bảo vệ môi trường của dự án các nội dung theo quy định tại Thông tư số 05/ 2008/ TT-BTNMT ngày 08 tháng 12 năm 2008 của Bộ Tài nguyên và Môi trường hướng dẫn về đánh giá môi trường chiến lược, đánh giá tác động môi trường và cam kết bảo vệ môi trường.

**Điều 3.** Bản cam kết bảo vệ môi trường của Dự án và Giấy xác nhận này là cơ sở để các cơ quan quản lý nhà nước về bảo vệ môi trường giám sát, kiểm tra, thanh tra việc thực hiện bảo vệ môi trường trong suốt quá trình thi công xây dựng và vận hành dự án.

**Điều 4.** Giấy xác nhận này có hiệu lực kể từ ngày ký/.

**Nơi nhận:**

- Chủ dự án;
- Chi cục BVMT tỉnh;
- Thường vụ Huyện ủy;
- TT. HĐND Huyện;
- CT và các PCT UBND Huyện;
- Phòng TN&MT Huyện;
- UBND xã Phú Vinh;
- VP: LD, CV, VT;
- Lưu VT, LT. *ψ*

**TM. ỦY BAN NHÂN DÂN**  
**KI. CHỦ TỊCH**



*[Signature]*

**PHÓ CHỦ TỊCH**  
*Nguyễn Quốc Cường*

**A Luoi District People  
Committee**

**Socialist Republic of Vietnam  
Independence - Freedom - Happiness**

Ref No 07/GXN-UBND

*A Luoi, 24/06/2010*

**CERTIFICATE  
of Registration of Environmental Protection Commitments  
for A Roang Hydropower Project**

**A Luoi District People Committee  
CERTIFIES**

**Article 1:** On 07 April 2010, the Project Owner, Central Rural Electricity Project Management Board, submitted Official Letter 1145/DANT-TD to register environmental protection commitments for A Roang hydropower project at A Roang commune, A Luoi District, Thua Thien Hue Province

**Article 2:** The Project Owner has responsibilities to fully implement the content of the stated environmental protection commitments and requirements follows as:

1. Establish, register and certify the additional registration of Environmental Protection Commitments if this project has basic changes on technology or size, capacity, project location; in case change of project location and change of appropriate Authority for approval occur at the same time, Owner has to re-prepare document for Registration of Environmental Protection Commitments
2. The additional Environmental Protection Commitments has to fully implement followed to Circular no.05/2008/TT-BTNMT on 08 Dec-2008 of MONRE providing guideline of assessment of strategic environment, environmental impact assessment and environmental protection commitments.
3. If need to use the underground water, the Owner has to fully implement the Water Resource Law, Decision no.84/2008/QD-UBND on 11 Jan,2008 of Thua Thien Hue District People Committee providing regulations on management, using and protecting of water resource and discharge waste water to water resource in Thua Thien Hue Province.
4. Addition into Environmental Protection Commitments the contents followed to Circular no.05/2008/TT-BTNMT.

**Article 3:** The environmental protection commitments of the Project and this certificate constitute the basis for environmental state management agencies to supervise, control and inspect the implementation of environmental protection of the Project during whole time of construction and operation phase

**Article 4:** This Certificate is effective from the date of issuance.

Recipients:

- Project Owner;
- District's Environmental Protection Department;
- District People Committee;
- DONRE;
- ; Archives

**On behalf of A Luoi District People Committee  
Vice Chairman**

(signature and stamp)  
**Nguyen Quoc Cuong**

#### Appendix 4: Safeguard Commitment of Ground Clearance Detected explosive and mine

BỘ TƯ LỆNH QUÂN KHU 5  
CÔNG TY TNHH MTV ĐẦU TƯ  
XÂY DỰNG VẠN TƯỜNG

CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM  
Độc lập - Tự do - Hạnh phúc

Đà Nẵng, Ngày 7 tháng 6 năm 2010

### CAM KẾT AN TOÀN MẶT BẰNG ĐÃ ĐƯỢC RÀ PHÁ BOM Mìn VẬT NỔ

**Kính gửi:**

- Ban Quản lý dự án Điện nông thôn miền Trung;
- Các đơn vị xây lắp có liên quan trên địa bàn.

Thực hiện hợp đồng kinh tế số: 52/3/10/HĐ-DANL/KH ngày 10/03/2010 ký giữa Ban quản lý dự án Điện nông thôn miền Trung với Công ty TNHH MTV Đầu tư Xây dựng Vạn Tường về việc dò tìm và xử lý bom, mìn, vật nổ dự án: Nhà máy thủy điện A Roàng, tỉnh Thừa Thiên Huế. Nay Công ty TNHH MTV Đầu tư Xây dựng Vạn Tường cam kết như sau:

#### 1. Phạm vi diện tích, độ sâu đã được dò tìm, xử lý bom mìn - Vật nổ:

Phạm vi thi công rà phá bom mìn, vật nổ được xác định trên thực địa bằng các cọc gỗ hoặc sơn đỏ có bình đồ hoàn công kèm theo, với tổng diện tích đã được dò tìm và xử lý bom mìn, vật nổ theo đúng yêu cầu của chủ đầu tư. Cụ thể như sau:

\* **Phạm vi thi công:** Theo đúng ranh giới cọc, mốc đo chủ đầu tư bàn giao tại hiện trường theo biên bản bàn giao tìm, mốc thi công rà phá bom, mìn, vật nổ.

##### \* **Tổng diện tích:**

- Dò tìm trên cạn	: 21,48 ha
- Dò tìm dưới nước	: 0,50 ha

##### \* **Độ sâu rà phá bom mìn vật nổ:**

###### + **Phần trên cạn**

- Đến 0,3m tính từ mặt đất tự nhiên hiện tại trở xuống	: 21,48 ha
- Đến 3,0m tính từ mặt đất tự nhiên hiện tại trở xuống	: 13,78 ha
- Đến 5,0m tính từ mặt đất tự nhiên hiện tại trở xuống	: 6,58 ha

###### + **Phần dưới nước**

- Đến 0,5m tính từ đáy nước hiện tại trở xuống	: 0,50 ha
- Đến 5,0m tính từ đáy nước hiện tại trở xuống	: 0,50 ha

#### 2. Hành lang an toàn:

##### \* **Phần trên cạn:**

- Đường thi công vận hành và đường ống áp lực: Tính từ chân ta luy thiết kế ra mỗi bên 3m

- Nhà quản lý vận hành; khu phụ trợ, lán trại; Cụm công trình đầu mối; Tháp điều áp + Nhà van + Cửa ra hầm dẫn nước và Nhà máy + Kênh xả + Trạm biến áp tính từ mép ta luy thiết kế : ra mỗi bên 5m

##### \* **Phần dưới nước:**

Cụm công trình đầu mối phần dưới nước: Tính từ chân ta luy thiết kế ra 2 bên mỗi bên 20 mét về phía thượng lưu và hạ lưu.



### 3. Cam kết:

Công ty TNHH MTV ĐTXD Vạn Tường cam kết đã dọn sạch bom mìn vật nổ và chịu hoàn toàn trách nhiệm về mặt bom mìn, vật nổ nếu còn sót lại trong phạm vi diện tích mặt bằng và các độ sâu kể trên.

Nơi nhận

- Như trên;
- Lưu: Pbm



Đại tá Lê Thanh Hậu

Đại trưởng thi công : ..... Bùi Xuân Lượng  
Kỹ thuật thi công : ..... Đặng Hùng

**High Command of Military zone no.5**

Investment & Construction  
Van Tuong One Member Co.,Ltd

**Socialist Republic of Vietnam**  
**Independence - Freedom - Happiness**

*Danang, June 7, 2010*

**SAFEGUARD COMMITMENT**  
**of Ground Clearance Detected mine and explosive**  
-----

**To: - Central Rural Electricity Project Management Board**  
**- Related construction companies in the same area**

The Investment and Construction Van Tuong One Member Co.,Ltd commits below as:

**Article 1: The area, depth of the ground finded and detected mine- explosive:**

The range of detecting mine- explosive is determined at the site by the wooden stakes or red paint, the total area detected mine – explosive following to the investor requirement. The details as below:

- ***The range of finding and detecting:*** Following to the range of stakes,landmarks which the investor handovered at the site.
- ***The total area:***  
  
Detecting on the ground: 21.48 ha  
  
Detecting under the water: 0.5 ha
- ***The depth of detecting mine – explosive:***  
  
+ On the ground:  
  
0.3m from the ground flowing down: 21.48 ha  
  
3m from the ground flowing down: 13.78 ha  
  
5m from the ground flowing down: 6.58 ha  
  
+ Under the water:  
  
0.5m from the bed of lake following down: 0.5 ha  
  
5m from the bed of lake following down: 0.5 ha

**Article 2: Secure corridor:**

- ***On the ground:***  
  
+ Access road and penstock: distance from steep slope to 2 sides is 3m  
  
+ Administration house; service zone, camps; head-works; surge tank + valve house  
+ outlet door to intake tunnel and powerhouse + tailrace + transformer station:  
distance from steep slope to 2 sides is 5m
- ***Under water:***

The part under water of the head work : Distance from steep slope to 2 sides is 20m following to the direction of upstream and downstream .

**Article 3: Commitment**

- The Investment and Construction Van Tuong One Member Co.,Ltd commits that detecting all of mine and explosive; is responsible for residual mine and explosive on the site and the depth as above.

Recipients:

- As above
- ; Archives

**GENERAL DIRECTOR**

(signature and stamp)  
**Colonel Le Thanh Hau**



#### Appendix 4: Photographs of the project site



**Overview of A Roang hydropower site**



**Covering the slope of dam by grass**



**Implementing tunnel**

## Appendix 5: Test reports



CHỦ CỤC BẢO VỆ MÔI TRƯỜNG TỈNH THỪA THIÊN HUẾ  
TRẠM QUAN TRẮC VÀ PHÂN TÍCH MÔI TRƯỜNG  
ENVIRONMENTAL PROTECTION AGENCY OF THUA THIEN HUE PROVINCE  
STATION OF ENVIRONMENTAL MONITORING AND ANALYSIS

Địa chỉ: 173 Phạm Văn Đồng St., Huế City  
Email: Trungquancantrungchi@gmail.com  
Tel: 054.3915206-3912526  
Fax: 054.3915206

Số/Ref: 001/130925/KQHT

Ngày/Date: 25/9/2013

## PHIẾU KẾT QUẢ ĐO ĐẠC HIỆN TRƯỜNG

1. Tên mẫu
2. Số điểm đo
3. Ngày đo
4. Thiết bị đo
5. Tên khách hàng

Tiếng ồn  
:01  
:12/9/2013  
:Máy Data Logger Sound Level Meter CR: 704B;

NPP thủy điện A Roàng

## KẾT QUẢ

TT	Vị trí (Location)	Chỉ số hiệu quả	Tiếng ồn (dB)
1.	Cầu A Roàng	K <sub>ABC</sub>	64,5

CÁN BỘ KÝ THUẬT

Nguyễn Đình Phước

CÁN BỘ QUẢN LÝ TRÁCH

Thư Đặng Phước Bình

BM. 13.01

Lần ban hành: 01



CƠ CỤC BẢO VỆ MÔI TRƯỜNG TỈNH THỪA THIÊN HUẾ  
TRẠM QUAN TRẮC VÀ PHÂN TÍCH MÔI TRƯỜNG  
ENVIRONMENTAL PROTECTION AGENCY OF THUA THIEN HUE PROVINCE  
STATION OF ENVIRONMENTAL MONITORING AND ANALYSIS

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Email: [ThuaThienhuong@tthp.gov.vn](mailto:ThuaThienhuong@tthp.gov.vn)  
Tel: 091.907.026-02620  
Fax: 091.907.026

Số Ref: 001/130925/KQPT

Ngày/Date: 23/9/2013

### PHIẾU KẾT QUẢ THỬ NGHIỆM TEST REPORT

(These test result are valid only for this tested sample)

- Tên mẫu /Name of sample : Không khí
- Ký hiệu mẫu/Mark of sample : K<sub>AR</sub>
- Số phiếu yêu cầu TN/N<sup>o</sup> of sample : KH01-1
- Ngày nhận mẫu/Date of receiving : 12/9/2013
- Số lượng mẫu/Quantity : 01
- Tên khách hàng/Client : Nhà máy thủy điện A Roang
- Thông tin mẫu/Information of sample :  
K<sub>AR</sub>: Cầu A Roang

TT N <sup>o</sup>	Tên chỉ tiêu Characteristic	Đơn vị Unit	Kết quả (Result) Value
1	Bụi lơ lửng (TSP)	µg/m <sup>3</sup>	190,2
2	Bụi PM10	µg/m <sup>3</sup>	48,3

PHÒNG PHÂN TÍCH HÓA SINH  
(Biochemistry Laboratory)

PHÓ TRƯỞNG PHỤ TRÁCH  
(Deputy Head of Station in Charge)

Nguyễn Đình Phước

Ths. Đặng Phước Bình

ĐM. 13.02

Lưu bản gốc: 01





CHỖ CỤC BẢO VỆ MÔI TRƯỜNG TỈNH THỪA THIÊN HUẾ  
TRẠM QUAN TRẮC VÀ PHÂN TÍCH MÔI TRƯỜNG  
ENVIRONMENTAL PROTECTION AGENCY OF THUA THIEN HUE PROVINCE  
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Tel: 054.3915286-3915287  
Fax: 054.3915206

Số/Ref: 001/130925/KQPT

Ngày/Date: 25/9/2013

### PHIẾU KẾT QUẢ THỬ NGHIỆM TEST REPORT

(These test result are valid only for this tested sample)

- Tên mẫu /Name of sample : Nước mặt
- Ký hiệu mẫu/Mark of sample : NAR1; NAR2; NAR3
- Số phiếu yêu cầu TN/Nº of sample : K1001-1
- Ngày nhận mẫu/Date of Receiving : 12/9/2013
- Số lượng mẫu/Quantity : 03
- Tên khách hàng/Clien : Nhà máy Thủy Điện A Roang
- Thông tin mẫu/Information of sample :  
NAR1: Thượng lưu đập (châu A Roang);  
NAR2: Hạ lưu đập;  
NAR3: Mẫu nước suối phía hạ lưu đập.

TT (Nº)	Tên chỉ tiêu (Characteristics)	Phương pháp phân tích (Method)	Đơn vị (Unit)	Kết quả (Test results)		
				NAR1	NAR2	NAR3
1.	pH			6,7	6,7	6,6
2.	Độ đục	Horiba 520	NTU	0	2	9
3.	DO	Horiba 520	mg/l	6,5	6,7	6,4
4.	BOD <sub>5</sub>	TCVN 6001-2:2005	mg/l	0,1	4,0	5,8
5.	Dầu mỡ khoáng	TCVN 5070:1995	mg/l	KPH*	KPH*	KPH*
6.	Coliform	TCVN 6187-2:1996	MPN/100ml	1,9.10 <sup>2</sup>	1,0.10 <sup>2</sup>	2,2.10 <sup>2</sup>

Ghi chú: KPH\*: giới hạn phát hiện của phương pháp là 0,3 mg/l

PHÒNG PHÂN TÍCH HÓA SINH  
(Biochemistry Laboratory)

Nguyễn Đình Phước

PHÓ TRAM TRƯỞNG PHỤ TRÁCH  
(Vice Head of Station in Charge)

ThS. Đặng Phước Bình

BM.13.02

Lần ban hành: 01



CHỦ TỊCH BAN YẾU MÔI TRƯỜNG TỈNH THUA THIÊN HUẾ  
TRẠNG QUAN TRÁC VÀ PHÂN TÍCH MÔI TRƯỜNG  
ENVIRONMENTAL PROTECTION AGENCY OF THUA THIEN HUE PROVINCE  
STATION OF ENVIRONMENTAL MONITORING AND ANALYSIS

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Fax: 094.703.020

Số báo: 001/2013/KQH

Ngày Date: 21/11/2013

## PHIẾU KẾT QUẢ ĐO ĐẠC HIỆN TRƯỜNG

1. Tên mẫu
2. Số mẫu
3. Ngày đo
4. Thời gian đo

Hiệu ứng âm

01

12/11/2013

Máy Đo Logging Sound Level Meter CR: 704B;

5. Địa điểm đo

Nhà máy thủy điện A Roang

### KẾT QUẢ

STT	Vị trí (Location)	Hiệu ứng âm	Tiếng ồn (dB)
1	Cầu A Roang		62,3

CHỖ ĐO KÝ

TRƯỞNG PHỤ TRÁCH

Nguyễn Đình Phước

Trần Đình Phước Bình



CHỖ CỤC BẢO VỆ MÔI TRƯỜNG TỈNH THỪA THIÊN HUẾ  
TRẠM QUAN TRẮC VÀ PHÂN TÍCH MÔI TRƯỜNG  
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Tel: 054.3813186-3813636  
Fax: 054.3813206

Số/Ref: 001/131121/KQPT

Ngày/Date: 21/11/2013

## PHIẾU KẾT QUẢ THỬ NGHIỆM TEST REPORT

*(These test result are valid only for this tested sample)*

1. Tên mẫu /Name of sample : Không khí
2. Ký hiệu mẫu/Mark of sample : K<sub>AR</sub>
3. Số phiếu yêu cầu TN/N<sup>o</sup> of sample : KH01-1
4. Ngày nhận mẫu/Date of Receiving : 12/11/2013
5. Số lượng mẫu/Quantity : 01
6. Tên khách hàng/Client : Nhà máy thủy điện A Roang
7. Thông tin mẫu/Information of sample :  
KAR: Cầu A Roang

TT N <sup>o</sup>	Tên chỉ tiêu (Characteristics)	Đơn vị (Unit)	Kết quả (Results)
1	Bụi lơ lửng (TSP)	µg/m <sup>3</sup>	173,5
2	Bụi PM <sub>10</sub>	µg/m <sup>3</sup>	42,0

PHÒNG PHÂN TÍCH HÓA SINH  
(Biochemistry Laboratory)

PHÓ TRƯỞNG PHỤ TRÁCH  
(Deputy Head of Station in Charge)

Nguyễn Đình Phước

ThS. Đặng Phước Bình

BM. 13.02

Lần ban hành: 01

