

# Environmental Monitoring Report

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Semestral Report  
January-June 2011

## VIE: Song Bung 4 Hydropower Project

Prepared by Song Bung 4 Hydropower Project Management Board (SB4HPMB) for Vietnam Electricity and the Asian Development Bank.


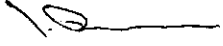
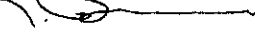
# **Song Bung 4 Hydropower Project**

## **Six Monthly Environment Report**

**January - June 2011**

**SB4 Hydropower Project Management Board**

# Issue and revision record

Revision	Date	Originator	Checker	Approver	Description
A	12 July 2011	Pham Hong Thai (PECC4)  Phan Thi Cam Tu (SB4)	I Davison (MM)		
B	10 <sup>th</sup> August 2011	Pham Hong Thai (PECC4) 	I Davison (MM) 	I Davison (MM) 	Issue to Client and ADB

# Song Bung 4 Hydropower Project

## Six Monthly Environment Report

### January – June 2011

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**Implementation of the Song Bung 4 Hydropower Project will contribute to the socio-economic**

- Construction of the explosive store is finished, and Oil Depot nearly completion.
- The stripping of the overburden material at the rock quarry has started with the material being placed in Auxiliary Area 1 to form a platform for the RCC aggregate crushing plant.
- Excavation of the right and left abutments has progressed and is now about 40% complete. Shotcreting of the slopes has also started with about 10% of the slopes protected.
- The longitudinal cofferdam for the dam has been partially constructed and the excavation for the diversion culvert is now approximately 50% complete. The foundation has been blinded with concrete to protect the surface and the retaining wall TC1 is 50% complete.
- The open excavation of the surge shaft, power station and switchyard are all progressing. Overall, the excavation for the surge shaft is about 80% complete and the power station/switchyard area is 50% complete. Approximately 60% of the surge shaft slopes have been protected with shotcrete.
- Development of disposal areas 1, 2 and 4 has continued.
- Access Roads D2, D5, D8, D10, D12 and D18 are all useable although they are not complete as the slopes have not been adequately trimmed and drainage has not been provided.
- Erection Crushing plant and Batching plant near Right Abutment
- Adit1 is now approximately 50% complete.
- Contracts TB04 for the electro-mechanical: the rebid tenders for this package were opened on the 6<sup>th</sup> June and the evaluation progress is currently underway in Da Nang by a Mott Macdonald team from UK assisted by PECC4.
- Contracts TB05 for hydro-mechanical: this contract was awarded to Hydraulic Equipment Joint Stock Company (HESCO) of Ha Noi, Vietnam but no work has started on site.
- Social Consultant has carried out independent environmental monitoring of the site and surrounding area on a three monthly basis under Contract Package TV16.
- Mott MacDonald (MM) and PECC4 are on site to carry out the site supervision duties under Contract Package TV2.

#### **1.4 Purpose of the Report**

This report presents a review of the environmental management of the Song Bung 4 during the first six months of 2011 and looks forward to the work that will be carried out during the last six months of 2011. The report describes the construction work that has taken place, the environmental monitoring of this construction work, the mitigation methods that have been carried out and then looks forward to the monitoring and mitigation that will be required.

The fourth camp is located just downstream of the dam on the left bank to serve the construction of left abutment and diversion culvert and a fifth camp is located at Auxiliary Area 1 for the rock quarry construction. The domestic water at these two areas has not yet been tested. At the moment the contractor is using bottle water. These areas have dining rooms, accommodation and bathrooms. However, they lack drainage ditches, settlement ponds and oil septic tanks at bathroom and kitchen.

The explosive store had completed and is now in use, the main oil depot has almost been completed but still requires security fencing and adequate oil trap and drainage ditches. The contractor seems to find it difficult to complete this matter.

The Contractor's maintenance of the access roads continues to be very poor. During April and May, there was heavy rain that caused several small landslides on the access roads and there are numerous drains that are now blocked. SCL hired small team local people working on keeping the road ditches clean by using hand shovels. However, they do not fill up potholes on the road with suitable material, and the drains are not cleared. Recently this team have disappeared and with the trucks continuing to be overloaded the road surface deteriorates further. Landslide still remains on the road and the Contractor do not wash well of truck before out of working area. This has caused the roads to become very dirty and slipper in wet condition.

In dry weather, the roads become excessively dusty and although two water tankers have been purchased by the contractor, they cannot cope with the conditions on the driest days. It has been recommended to the contractor that he purchases more tankers but so far he has not taken any action. The two existing tankers regularly break down.

Serious problems have been encountered with the contractor's blasting management and explosive control. There have been regular breaches of the safety requirements during blasting as well as several unapproved blasts. This is very difficult to control.

### **2.1.2 Package XL01**

The Diversion Culvert works are the most critical of the project at the present time. The cofferdam was not constructed in accordance with the technical design and has been overtopped several times during last month with a significant amount of damage being caused to the cofferdam. The cofferdam was overtopped because the contractor has failed to widen and deepen the river section adjacent to the cofferdam as required by the contract.

The excavation of Diversion Culvert is very slow due to resources and unsuitable equipment. The contractor is now concreting at TC1. Last month, the cofferdam area was flooded with water but the contractor did not have enough personnel and equipment to clean it. This caused delays for the construction of the Diversion Culvert. The construction of the roads D2, D5, D7, D8, D11, and D12 is poor with incomplete drainage, poor compaction and over steep slopes of filled areas and over steep excavated slopes. This has led to landslides and reduced the safety of use during rainy periods. The contractor refuses to improve the condition of the roads.

The excavation of the soft material and rock from the Right Abutment has continued and the slopes are now almost complete down to EL200m although shotcreting of the slopes has only just started. However, there is insufficient plant being used to progress the work at an acceptable rate. A lot of material has been disposed by tipping over the side of the abutment or off the side of road D2 into Intake Valley. The contractor has been informed that money will be withheld from his monthly payments until he reinstates these slopes.

Excavation has continued on the Left Abutment with the slopes excavated down to EL300m and

- **Waste Water Quality** – the wastewater from the camp area toilets all require treatment.
- **Site Safety** – all aspects of the construction require safety consideration (safety for worker during working progress). The safety during material transportation on the access roads: the trucks are always overloaded and over speeded.

## 2.3 Environmental Monitoring

### 2.3.1 Civil Contractor

From January to June of 2011, the following environmental work has been carried out:

- Monthly Environmental reports
- Participated in weekly environment check with site supervision staff
- Water quality sampling and testing
- Air, noise and dust monitoring

The following table shows the monitoring that has been carried out by the SCL during the last six months:

No	Samples	Date	Locations	Remark
1	Domestic water	5/4/2011	<ul style="list-style-type: none"> <li>- 01 sample at the Camp area 45</li> <li>- 01 sample domestic water at new Camp area 13</li> <li>- 01 sample domestic water at old Camp area 13</li> <li>- 01 sample domestic water at the Explosive Store</li> <li>- 01 sample domestic water at the Office of Contractor</li> <li>- 01 sample proposed domestic water at the Auxiliary 1</li> </ul>	Environment Monitoring report on April
2	Surface water	5/1/2011	<ul style="list-style-type: none"> <li>- 01 sample at upstream of dam</li> <li>- 01 sample at downstream of dam</li> <li>- 01 sample at powerhouse</li> </ul>	Environment Monitoring report on January
		14/2/2011	<ul style="list-style-type: none"> <li>- 01 sample at upstream of dam</li> <li>- 01 sample at downstream of dam</li> <li>- 01 sample at powerhouse</li> </ul>	Environment Monitoring report on February
		1/3/2011	<ul style="list-style-type: none"> <li>- 01 sample at upstream of dam</li> </ul>	Environment Monitoring

- The 4<sup>th</sup> environment monitoring report (The construction stage) in April 2011.

### 2.3.3 Site Supervisory Staff

Mott MacDonald in association with PECC4 has carried out the following environmental work during the first six months of 2011.

- Weekly environment checks, joint with the SCL
- Review water quality monitoring results submitted by SCL
- Review of SCL monitoring reports
- Issuing of environmental, safety and quality non-conformance reports to the contractor

### 2.3.4 Summary of Monitoring Results

A summary of the monitoring results produced by both SCL and Socio Consult are given below:

#### Domestic wastewater

Parameter	Unit	Result from Social Consult (April, 2011)		Result from contractor (Environmental monthly report of April, 2011)		VN standard (QCVN 14/2008/BTNMT)
		NT1	NT2	NT1	NT2	
pH		7.5	8.2	7.2	7.2	5-9
BOD5 at 20°C	mg/l	576	84	<3	100	50
Total suspended solids (TSS)	mg/l	212	26	25	20	100
Total Dissolved solids	mg/l			85.6	27.6	1000
Ammonia in N	mg/l	187	50	0.35	4	10
Nitrate (NO <sub>3</sub> ) as N	mg/l	19.2	6.2	6.5	12.2	50
Oil, plant and animal	mg/l	0.4	0.1	0.92	2.52	20
Phosphate (PO <sub>4</sub> <sup>-3</sup> ) in P	mg/l	8.1	2.8	0.08	0.28	10
Total Coliforms	MPN/100ml	93.10 <sup>4</sup>	21.10 <sup>3</sup>	93.10 <sup>3</sup>	46.10 <sup>4</sup>	5000

Social consult: NT1: at outlet of septic tank at the Main camp  
NT2: at outlet of septic tank at the Camp area 45

Contractor: - NT1: at outlet of drain the Main camp  
- NT2: at the receiving wastewater from the camp 45

The bold values in the table above indicate the tests that have exceeded the values permitted by the Vietnamese standards. These results suggest that the septic tanks at the Main Camp and at Camp 45 are not operating efficiently. This problem has been raised regularly with SCL but they have still to carryout remedial work, which will require the rebuilding, or refurbishment of the septic tanks and the waste disposal system. It should be noted that Social Consult are taking their measurements at slightly different locations from SCL.

### Domestic water

Parameter	Unit	Result from social consul (April, 2011)			Result contractor (Environmental monthly report of April, 2011)					VN standard (QCVN-02:2009/BTY)
		SH1	SH2	SH3	SH1	SH2	SH3	SH4	SH5	
pH		6.12	7.2	7.38	6.9	7	7.1	7	6.9	6-8.5
TSS	mg/l				<2	<2	<2	<2	<2	
BOD <sub>5</sub>	mg/l				<0,5	0,58	3,4	<0,5	1,1	
COD	mg/l				<2	<2	8	<2	3	
Turbidity	NTU	10.2	21	11.5						5
Amoni-Nitrogen (N-NH <sub>4</sub> )	mg/l	0.42	0.31	2.18						3
Nito tong (as N)	mg/l				3,2	5,6	4,2	3,4	4,8	
NO <sub>3</sub> <sup>-</sup> - N	mg/l				2,9	4,5	3,5	2,8	3,3	
NH <sub>4</sub> <sup>+</sup> - N	mg/l				<0,06	0,1	0,1	0,06	0,14	
Phospho tong (as P)	mg/l				0,23	0,2	0,24	0,08	0,06	
Total Coliform	MPN/100l	430	2100	4600	240	460	11000	2400	1500	150
Colour	TCU	14	16	64						15
Taste		-	-	-						No strange smell
Ecoli	MPN/100l	<3	23	430						20

- Social consul:**
- SH1: at administrative building
  - SH2: at common water container of Vinh village, TabHing commune
  - SH3: at common water container of Chaval commune
- Contractor:**
- SH1: domestic water at Camp area 45
  - SH2: domestic water at new Camp area 13
  - SH3: domestic water at old Camp area 13
  - SH4: domestic water at the Explosive Store
  - SH5: domestic water at the Office of Contractor
  - SH6: proposed domestic water at the Auxiliary 1

A comparison between the results obtained by Social Consult and SCL is not possible as the samples are from different locations. The only comment that can be made is that there is generally high Total Coliforms across the entire project area and its environs.

**Solid waste:** including construction solid waste and living solid waste

For living solid waste from the camps, the garbage is first burned and then buried. Waste from the kitchens is collected by the locals for use in feeding animals.

Construction solid waste includes settlement pond tailings, cement bags, formwork, and vegetation

Parameter	Location	Times				Viet Nam Standard (TCVN 3985:1999)
		1	2	3	4	
	Disposal No.1	-	-	-	-	
	Surge Shaft	-	-	-	-	
	Cofferdam	-	-	-	-	
	Adit1	-	-	-	-	

These results suggest that noise and air pollution are not a problem. However, there is no indication of the time of day that the sampling was carried out or of the construction processes that were underway at the time of the sampling. The weather would also have a significant difference on the sampling results. At the quarry, there is only stripping of the overburden material from the site and no blasting has started. Also at the dam site, it would not be expected that the noise limits would generally be exceeded except for short periods such as during blasting or if very close to some of the drilling machines. It can be seen that the noise levels in the Adit are excessive but this is to be expected and SCL should be providing, but are not, ear protectors to all workers in the tunnel.

It is considered that the dust sampling results are not representative of the conditions at the quarry (KK2) and at the dam site (KK1). At both of these locations as well as many others around the construction site, the levels of dust are excessive on most days. SCL's method of working encourages excessive dust. They do not maintain their access roads and this causes more dust than should be expected. They also have insufficient water tankers and these in themselves are poorly maintained and have regular breakdowns.

### 2.3.5 Summary of Safety Problems

During the last six months, there have been the following reported traffic accidents on the site:

Date	Incident	Injuries	Cause
Dec 10	Truck reversed into Substation T13 at Surge Shaft	Nil	Carelessness / no protective barrier
Jan 11	Truck reversed into Substation T5 at Area 13	Nil	Carelessness / no protective barrier
Jan 11	Collision between two trucks at D1	Nil	Speeding / driving too close / poor road surface
Feb 11	Vehicle out of control went through D1 barriers above Snake Valley	Nil	Carelessness / lack of signage / poor road surface
Mar 11	Vehicle out of control / overturned upstream of Adit 1	Nil	Speeding / carelessness / lack of signage / faulty brakes. Driver dismissed.
01/03/2011	Truck damaged overhead cables at Disposal Area 1	Nil	Carelessness

In the tunnel, the biggest safety problem is the use of the ventilation system. This is regularly switched off by the site staff. The matter has been raised several times with the SCL management and it is understood that they have fined some of their staff in relation to this problem. However, it still occurs and constant vigilance by the RE's staff is required.

The biggest construction problems that occur outside of the tunnel are the method of construction of the excavations. Due to the lateness of the construction work SCL have to work at several levels of the excavations at the right abutment and the power station/surge shaft. This means that there is excavation work being carried out above other areas where men are working. There is a significant risk of falling material in these areas although as far as we are aware there have not been any accidents to date.

## **2.4 Environmental Mitigation**

In general, SCL are poor at carrying out any environmental mitigation. Repeated written and verbal requests to improve are ignored. Work has been stopped on several occasions due to their method of excavation resulting in material being deposited in the Song Bung 4. This problem and all the environmental requirements have been discussed with the SCL management from China and they have promised that improvements will be made. In addition, money is being withheld from some of their monthly payments until they improve on their working methods and reduce their environmental impact. Improvements are still to be seen.

### **2.4.1 Mitigation Methods**

Mitigation methods carried out by contractor during the reporting period are as follows:

- Dustbins at camp areas to collect rubbish and waste food.
- Toilet, dining hall and bathroom are completed at the Main camp, Area 13, camp Left Bank, Auxiliary1 and Area 45.
- Construction drainage ditches, settlement ponds at main camp, explosive store, camp area 45. These are generally inadequate.
- The contractor brought 02 trucks with water tank to spray for reducing dust on the operation and construction roads. These are badly managed and maintained.
- The Contractor hired one team local people for clean landslide on the access roads and filled up the potholes. These people are infrequently on the site and do not provide a sufficient resources to adequately maintain the roads.
- Grass covering on the slopes of the explosive store to prevent erosion.

b. Mitigation methods planned but not yet carried out by contractor are as follows:

- Cleaning of drainage ditches and landslide on the access roads is not carried out regularly.
- Waste disposal area has not been constructed.
- No wheel wash facilities have been provided.

### **3. Environment Management in the next six months of 2011**

#### **3.1 General**

Some general objectives in the next six months of 2011 (July to December) are as follows:

- Monitor Sinohydro and their proposed monitoring and mitigation methods described in Site Environmental Management Plan.
- Continue regular monitoring of project performance by Sinohydro
- Continue weekly joint site inspections as part of the project performance monitoring
- Continue to write Non-conformance Report for contractor when there are environmental and health and safety problems.
- Continue to withhold money from Interim Payment requests.
- If there is not an improvement in the environmental management over the next six months then the RE will request the contractor to replace their environmental specialist and related staff.

#### **3.2 Water quality monitoring**

The main objectives for water quality monitoring in the last six months of 2011 are as follows:

- Environmental effects monitoring by SocialConsult at 3 month intervals.
- Construction monitoring by Sinohydro.
- Review of results by Mott MacDonald/PECC4

#### **3.3 Waste management**

- Monitor waste water quality by SCL and Socio Consult
- Approval of waste disposal sites proposed by Sinohydro
- Identify potential solid waste considered hazardous.
- Training by SCL for site workers and local people in environmental awareness.
- Improvement of site waste disposal facilities

#### **3.4 Erosion monitoring**

- Photographic monitoring of access road slopes, embankments and river banks will continue on a six monthly basis by SocialConsult.
- Visual monitoring of the slopes will also be carried out on daily basis by site supervisory staff to check that mitigation methods are constructed.

#### **3.5 Ambient Air Monitoring**

- Continue to monitor the ambient air quality parameters of SO<sub>2</sub>, CO, NO<sub>x</sub>, Suspended dust, Dust and Noise.

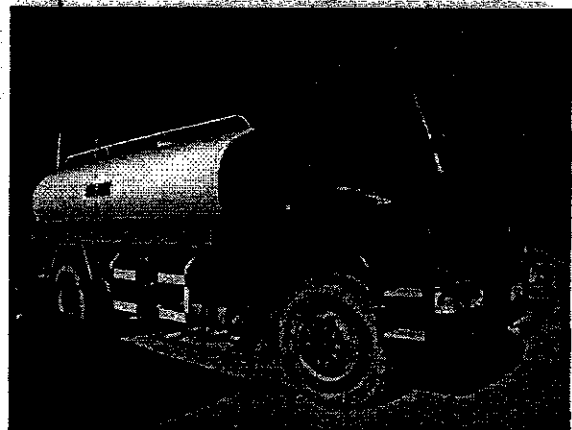
# APPENDIX

## Appendix 1: Photographs of environment monitoring carried out by SCL

### 1. Taking surface water sample and air environment

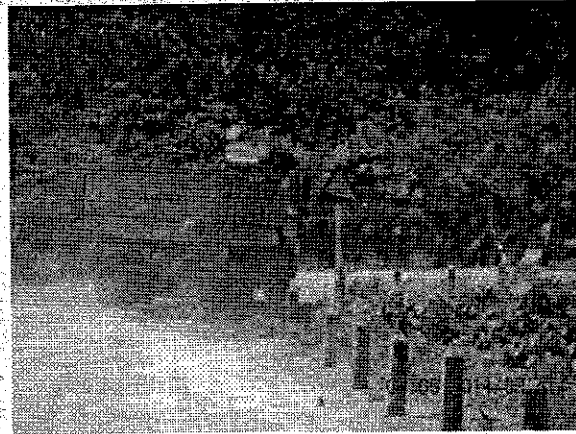
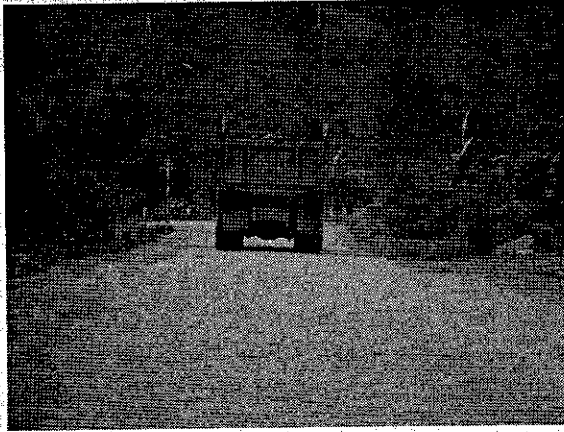


### 2. Water truck for reducing dust on the access roads and worker cleaning settlement pond at the explosive store

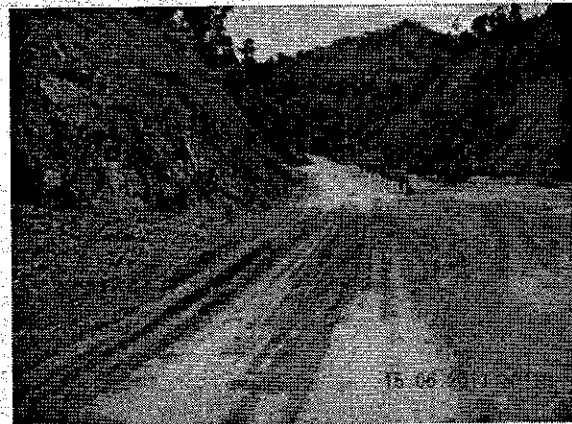


**Appendix 2: Photographs of environment hazards that are not being mitigated by SCL.**

**1. Overloading of trucks causing damage to roads and spillage of material onto roads.**



**2. Landslide on Road D1 that has not been cleared leaving the road in a poor condition and potholes does not fill up by suitable material**



**3. Settlement pond is not working and wastewater is not treatment correctly before discharge to environment at the Main camp and Camp area 45**

