

Environmental Monitoring Report

Semi-Annual Report (July to December 2015)
February 2016

CAM: Provincial Roads Improvement Project

Detailed Design and Implementation Supervision (DDIS) Consulting Services

Prepared by Korea Consultants International in association with Dainichi Consultant Inc., Sambo Engineering Co., Ltd. and Hankuk Engineering Consultants, and in Sub-consultancy with Moha Engineering & Consulting Co., Ltd., SBK, KACE and SAWAC for the Ministry of Public Works and Transport, the Kingdom of Cambodia, and the Asian Development Bank.

The Environmental and Social Performance Report is a document of the borrower. The views expressed herein do not necessarily represent those of ADB's Board of Directors, Management, or staff, and may be preliminary in nature. Your attention is directed to the "Terms of Use" section of this website.

Environmental Monitoring Report

Semi-Annual Report (July to December 2015)
February 2016

CAM: Provincial Roads Improvement Project

Detailed Design and Implementation Supervision (DDIS) Consulting Services



Prepared by Korea Consultants International in association with Dainichi Consultant Inc., Sambo Engineering Co., Ltd. and Hankuk Engineering Consultants, and in Sub-consultancy with Moha Engineering & Consulting Co., Ltd., SBK, KACE and SAWAC for the Ministry of Public Works and Transport, the Kingdom of Cambodia, and the Asian Development Bank.

The Environmental and Social Performance Report is a document of the borrower. The views expressed herein do not necessarily represent those of ADB's Board of Directors, Management, or staff, and may be preliminary in nature. Your attention is directed to the "Terms of Use" section of this website.



KINGDOM OF CAMBODIA

MINISTRY OF PUBLIC WORKS AND TRANSPORT

PROVINCIAL ROADS IMPROVEMENT PROJECT
ADB LOAN 2839-CAM (SF)/8254-CAM (SCF)

**Consulting Services for
Detailed Design and Implementation Supervision (DDIS)**

SEMI-ANNUAL ENVIRONMENTAL MONITORING REPORT

Covering Period from July to December 2015

February 2016



Korea Consultants International

In association with

**Dainichi Consultant Inc., Sambo Engineering Co., Ltd.
and Hankuk Engineering Consultants**

In Sub-consultancy with

Moha Engineering & Consulting Co., Ltd., SBK, KACE and SAWAC

Contents

EXECUTIVE SUMMARY	i
1. Introduction	1
2. Environment Monitoring Mechanism.....	4
2.1 Introduction	4
2.2 Environmental Management Plan (EMP) and CEMP	4
2.3 Environmental Monitoring Program.....	4
2.4 Measurements.....	5
2.5 Timing of Monitoring	6
2.6 Monitoring of CEMP by Checklists	6
2.7 Establishment of SEO.....	7
3. Results of Environmental Monitoring	7
3.1 Contract CW-A: Improvement of NR13 in Svay Rieng and Prey Veng.....	7
3.2 Contract CW-B1: Improvement of PR314D in Svay Rieng	11
3.3 Contract CW-C: Improvement of PR150B, NR53 and PR151B	14
4. Review of Environmental Parameters.....	17
5. Corrective Actions.....	20
6. Outstanding Issues	20
7. Conclusion.....	20

Figures:

Figure 1: Embankment works at end point of NR13, date 20 January 2016.....	8
Figure 2: Embankment work activities at NR13, date 20 January 2016	8
Figure 3: Embankment works at PK61+000, date 20 January 2016.....	8
Figure 4: Activity of embankment works at NR13, date 20 January 2016	8
Figure 5: Borrow pit at PK48+300 (RHS), date 20 January 2016.....	9
Figure 6: Borrow pit at PK48+300 (RHS), date 20 January 2016.....	9
Figure 7: Regular sprinkling water was being done at NR13, date 20 January 2016	10
Figure 8: Regular sprinkling water was being done at NR13, date 20 January 2016	10
Figure 9: Good environment in/around the Contractor's site camp at PK58+400.....	10
Figure 10: Material stockpile along the project road, 20 January 2016	10
Figure 11: Cement stabilization batching plant along NR13 at PK 55+400, 26 January 2016.....	11
Figure 12: Cement stabilization batching plant without fence along NR13 at PK 55+400, 26 January 2016.....	11
Figure 13: Discussion meeting with RE for CW-A, CW-B1, date 20 Jan 2016	12
Figure 14: Earth work activities at NR314D for PK 15+500 to 20+000, date 20 Jan 16.....	12
Figure 15: Borrow pit at PK17+000 (LHS), date 20 January 2016	12
Figure 16: Borrow pit at PK17+000 (LHS), date 20 January 2016	12
Figure 17: Regular sprinkling water was done at PR314D, date 20 Jan 2016.....	13
Figure 18: Road after sprinkling water was done at PR314D, date 20 Jan 2016.....	13
Figure 19: Fuel Storage facilities is under construction for CW-B1, date 20 January 2016	13
Figure 20: Temporary fuel storage facilities at PR314D, date 20 January 2016.....	13
Figure 21: Fuel storage facilities are good condition at the main contractor's site camp	14
Figure 22: Properly Material storage in the workshop at the main contractor's site camp	14
Figure 23: Improper oil/fuel drum storage for PR150BW, at PK8+200, on 19 January 2016	15

Figure 24: Improper oil/fuel drum storage for PR150BW, at PK8+200, on 19 January 2016	15
Figure 25: Borrow pit was requested by owner to fish raising purposed at PK6+300	15
Figure 26: Borrow pits for PR150BW is not yet improved or re-fenced at PK14+500.....	15
Figure 27: Water spray truck is being stand by along the PR150B-W.....	16
Figure 28: Interviewing with water spray truck 's driver at PR150B-W	16
Figure 29: Extinguisher were equipped at the contractor's site camp, date 19 January 2016 ...	16
Figure 30: First aid kits were equipped at the contractor's site camp, date 19 January 2016....	16
Figure 31: Traffic safety barriers were installed inadiqueate at the PR151B, date 19 Jan 2016..	17
Figure 32: Traffic safety barriers were installed inadiqueate at the PR151B	17

List of Tables

Table 1: List of construction work.....	2
Table 2: Civil works Progress by December 2015	3
Table 3: Environmental Parameters Contract Packages CW-A, B1, B2, C, and D.....	18

Appendices

Appendix A- Checklist of EMP Implementation for Contract CW-A.....	21
Appendix B- Checklist of EMP Implementation for Contract CW-B1	47
Appendix C- Checklist of EMP Implementation for Contract CW-C.....	73
Appendix D – Letter CW-A and CW-B1	99
Appendix E – Letter CW-C	115

ABBREVIATIONS

ADB	Asian Development Bank
AP	(Project) Affected Persons
BOD	biological oxygen demand
CBF	Cross Border Facility
CEMP	Contractor Environmental Management Plan
COI	Corridor of Impact
CW	Civil Work
DBST	Double Bituminous Surface Treatment
DDIS	Detailed Design and Implementation Supervision
EA	Executive Agency
EMP	Environmental Management Plan
EIA	Environmental Impact Assessment
GoC	Government of Cambodia
GGF	Good Governance Framework
GRM	Grievance Redress Mechanism
IEE	Initial Environmental Examination
KCI	Korea Consultants International
KEXIM	Korea Export and Import Bank
MCFA	Ministry of Culture and Fine Arts
MEF	Ministry of Economy and Finance
MOU	Memorandum of Understanding
MOE	Ministry of Environment
MRD	Ministry of Rural Development
MPWT	Ministry of Public Works and Transport
MT	motorized transport
NDF	Nordic Development Fund
NGO	Non-government Organization
NR	National Road
NTFP	non-timber forest products
PDOE	Provincial Department of Environment
PDRD	Provincial Department of Rural Development
PMU	Project Management Unit
PR	Provincial Road
PRIP	Provincial Road Improvement Project
PPE	Personal Protective Equipment
PPTA	Project Preparation Technical Assistance
RGC	Royal Government of Cambodia
ROW	Right of Way
RP	Resettlement Plan
SBST	Single Bituminous Surface Treatment
SDR	Special Drawing Right
SEO	Social and Environment Office
SPS	ADB's Safeguard Policy Statement
STD	Sexually Transmitted Disease
TOR	Terms of Reference
UNESCO	United Nations Educational Scientific and Cultural Organization
WB	World Bank
UXO	Unexploded Ordnance

EXECUTIVE SUMMARY

1. Asian Development Bank (ADB) approved Loan (ADB loan No. 2839-CAM (SF)/8254- CAM (SCF), approved on 16 December 2011) and Grant 0278-CAM for Improvement of Provincial Roads (PRIP) in southeastern and mid-west province in Cambodia as requested by the Government of Cambodia. This Project is a priority project in the Government's key infrastructure development agenda as it provides all-year access to provincial and rural agricultural communities of Prey Veng and Svay Rieng provinces of southeastern Cambodia, and Kampong Chhnang and Kampong Speu province in the mid-west of Cambodia.

2. The Project aims to rehabilitate of national/provincial roads in Kampong Chhnang, Kampong Speu, Prey Vang, and Svay Rieng provinces to climate resilient paved condition of provincial roads in the southeast and rural roads in the mid-west. The rehabilitation program will provide a safer, cost-effective provincial road network with all-year access from national road network to markets and other social services for provincial centers of southeastern and mid-western Cambodia. A new cross border facility (CBF) will be constructed at Prey Var, Svay Rieng to facilitate efficient cross border transport and trade between Cambodia and Vietnam. The Project will support a sustainable road maintenance regime in the Ministry of Public Works and Transport (MPWT), community-based road safety measures, HIV/AIDS and human trafficking prevention program (HHTPP), and climate resilient measures.

3. The Provincial Roads Improvement Project (PRIP) will be implemented for a Contract period of 36 months, from September 1st, 2014 and will be completed at the ends of August in 2017. There are five (5) Contract packages to be implemented under the project. These are: CW-A: Improvement of NR13 (62.4km); CW-B1: Improvement of PR314D (25.5km); CW-B2: Prey Var CBF; and CW-C: Improvement of NR53, PR150B and PR151B (70.63km), which are under Civil Works Output. Currently, CW-A, CW-B1, and CW-C had been already awarded at early 2014, and these contracts are progressing slowly (based on planned schedule with actual work). CW-B2 will be likely to award in the 3rd Quarter 2016. The remaining contract, CW-D which is split into 5 contract packages and either in designing or in bidding process, will be awarded under Improved Climate Resilience Output.

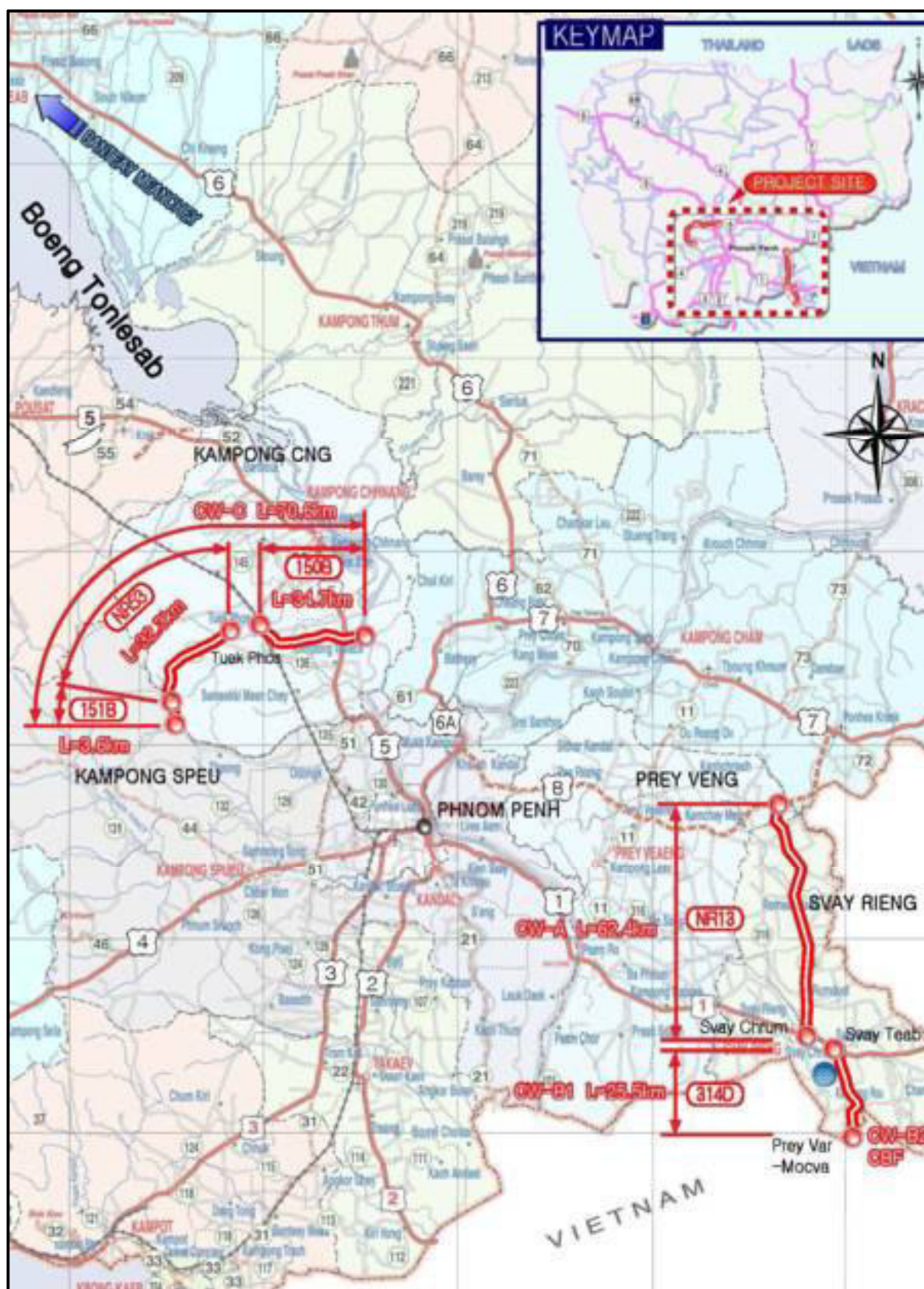
4. The Subprojects (CW-A; CW-B1) at the southeast of Cambodia, in which located at Prey Veng and Svay Rieng provinces, the roads will be upgraded to DBST¹ road, 11m width with 10m carriage way & 0.5m shoulder in both sides. The Subprojects (CW-C), on the other hand, at the mid-west is location at Kampong Chhnang and Kampong Speu provinces, the roads will be upgraded to SBST² road, 8m width with 6m carriage way & 1m shoulder in both sides (Cross Section of NR-53, PR-150B & PR-151B). The project is also reconstruction of bridges and installation of drainage structures such as box culverts and pipe culverts. Based on the results of IEE report which had been conducted as part of project preparation in accordance with ADB's Safeguard Policy Statement of 2009 (ADB SPS), the project is classified environmental **Category B**.

¹ DBST: Double Bituminous Surface Treatment

² SBST: Single Bituminous Surface Treatment

5. To monitor accurately documents in the semi-annual environmental monitoring report (SEMR), field monitoring and interviews were conducted on 19 to 21 January 2016, to inspect ongoing construction works which being carried out by the two (2) Contractors for CW-A, CW-B1 and the other for CW-C. During the monitoring, National Environmental Specialist has arranged meeting with RE, ARE of DDIS consultants in each subproject and also discussion meeting with the contractor's representatives. Furthermore, Local Authorities and Affected People were also interviewed. This Semi-annual report covers the period from July to December 2015, during construction stage of the subprojects of PRIP.
6. As a result of physical progress of the contracts by December 2015, progress indicated: 1) CW-A: Improvement of NR13 is progressing as a progress rate of 12.52% against planned 55.83%; 2) CW-B1 contract is progressing as a progress rate of 16.3% against planned 57.6%; and 3) CW-C contract is progressing as a progress rate of 20.58% against updated plan 27.06%.
7. Environmental mitigation measures were being implemented based on the environmental checklist, and contractors are trying to minimize the impact to nearby structures as much as they could. During that time, regular sprinkling of water on access roads was observed only one water truck was using for spraying water in each subproject. In addition, the regular monitoring for safeguards was carried out in actual field works i.e.: warning signs, traffic safety and use of personal protective equipment (PPE). Warning sign and traffic safety signs were installed at work activity area but insufficient at the dangerous areas such as deep excavations and arrow areas. PPE were provided to the workers, however; some workers still lack or are not using the appropriate PPE.
8. A major issue of concerning was observed during site inspection. Major issue is the inappropriate location of a cement stabilized batching plant along NR 13 at PK 55+400 within a residential area without any approval and permission from DDIS and commune. The DDIS consultant has addressed non-compliance issues related EMP implementation to the Contractor to take immediate action for reducing of the adverse environmental impacts in compliance with IEE and EMP. Responding to the environmental issue, the Contractor has actively organized equipment and personnel to correct non-compliance issue. However, proper remedy action is not shown during the monitoring.
9. Based on the surveyed it was found that no complain exists regarding project impacts and donation to the project. The interview, however, shows that they are happy with the project that they prefer the new road with access road to facilitate in travelling and expressed their gratitude to all of the donors as well as Cambodia Government for improvement of their quality of life and reducing poverty.

PROJECT LOCATION MAP



Provincial Roads Improvement Project at Southeastern and Mid-west province in Cambodia

1. Introduction

10. ABD has approved the Loan No.2839-CAM (SF)/8254-CAM (SCF) on 16 December 2011 and Grant 0278-CAM for Improvement of Provincial Roads at the southeastern and mid-west provinces in Cambodia as requested by the Government of Cambodia. This project is the most important project of the Royal Government of Cambodia to improve quality of people's life through improvement of roads and other infrastructures as it provides all-year access to provincial and rural agricultural communities of Prey Veng and Svay Rieng provinces of southeastern Cambodia, and Kampong Chhnang and Kampong Speu province in the mid-west of Cambodia.

11. The Provincial Roads Improvement Project (PRIP) will be implemented for a Contract period of 36 months, which commencement works from September 1st, 2014 and will be completed at the end of August in 2017, in selected national/provincial roads in 4 provinces of Cambodia, namely: (i) Svay Rieng, (ii) Prey Veng, (iii) Kampong Chhnang, and (iv) Kampong Speu. There are five (5) Contract packages to be implemented under the project in selected national roads and provincial roads in Cambodia in 4 provinces. These are: CW-A: Improvement of NR13 (62.4km); CW-B1: Improvement of PR314D (25.5km); CW-B2: Prey Var CBF; and CW-C: Improvement of NR53, PR150B and PR151B (70.63km), which are under Civil Works Output. The remaining contract, on the other hand, CW-D will be awarded under Improved Climate Resilience Output.

12. The project is expected to get more around 640,900 beneficiaries (Commune Database Online, 2010) residing in the areas covered by the project with the Ministry of Public Works and Transport (MPWT) as the Executing Agency (EA). The Project Management Unit 3 (PMU3), as part of the General Department of Public Works of MPWT, is the implementing agency of the Project. MPWT will be responsible for engaging consulting services and awarding civil works contracts. The Project Director of PMU3 will have overall administrative oversight of the consulting services and civil work contracts, and the Project Manager will have responsibility for day-to-day operations.

13. The road will provide an all-year road access from national road to other national roads and provincial town areas, and will provide greater accessibility to basic facilities and services. It will also strengthen the capacity of the MPWT to plan, manage and monitor road maintenance operations and implement the loan covenants and other conditions in the loan package. A Social and Environmental Office (SEO) has been established in MPWT and this will be strengthened during the project. It is also intended to further involve the Provincial Department of Public Works and Transport (PDPWT) in project implementation and monitoring.

14. The road will upgrade target existing poor conditioned unpaved and paved roads of NR/PR in four provinces to a paved road standard with double bituminous surface treatment (DBST) and single bituminous surface treatment (SBST). The project will also improve bridges and other drainage structures such as box culverts, pipe culverts, and side drainage systems. For these subprojects no new roads will be built. The Project is classified as environment category B and an initial environmental examination (IEE) was conducted as part of project preparation in accordance with ADB Safeguard Policy Statement of 2009 (ADB SPS). The list of the subproject roads is shown in Table 1.

Table 1: List of construction work

Contract	Road No.	Construction Works (road type)	Location			Length (km)	Width (m)
			Province	Starting Point	End Point		
CW-A	NR13	DBST road	-Prey Veng, -Svay Rieng	St.0+000 (Kamchay Mear district, Prey Veng province, Junction NR.08)	St.62+400 (Prosot district, Svay Rieng province, Junction NR.01)	62.4	11
CW-B1	PR314D	DBST road	-Svay Rieng	St.0+000 (Prosot district, Junction NR.01)	St.25+500 (Prey Vor, Cambodia-Vietnam Border)	25.5	11
CW-B2		CBF	-Svay Rieng				
CW-C	PR150B-E	SBST road	-Kampong Chhnang	St.0+000 (Thnal Thor Thoung, Junction NR.05)	St.5+447.33 (Taches market, Boeung Tonle Sap)	5.447	8
	PR150B-W	SBST road	-Kampong Chhnang	St.0+000 (Thnal Thor Thoung, Junction NR.05)	St.25+550 (Tuek Phos)	25.550	8
	NR53	SBST road	-Kampong Chhnang	St.0+000 (Chi Prang)	St.31+879.41 (Thnal Kaeng)	31.879	8
	PR151B	SBST road	-Kampong Speu	St.0+000 (Thnal Kaeng, Kampong Chhnang province)	St.3+581.25 (Amleang, Kampong Speu province)	3.581	8

Table 2: Civil works Progress by December 2015

Contract	Contract Amount (US\$)	Work Period	Progress (%)	Implementation of Work	Remarks
CW-A (NR13)	22,768,558.44	from Sep 2014 to Aug 2017	12.52	<ul style="list-style-type: none"> - January to June 2015: Site camp, De-Mining/UXO, Production of RC pipe, Clearing & Grubbing, Embankment, Bridge foundation, Installation of box and cross pipe culverts works - July to December 2015: Site camp, De-Mining/UXO, Production of aggregate base course material, Production of RC pipe, Embankment, Bridge foundation, Installation of box and cross pipe culverts works 	Sinohydro
CW-B1 (PR314D)	10,728,905.58	from Sep 2014 to Aug 2017	16.3	<ul style="list-style-type: none"> - January to June 2015: Site camp, De-Mining/UXO, Production of RC pipe, Clearing & Grubbing, Embankment, Installation of box and cross pipe culverts works - July to December 2015: Site camp, De-Mining/UXO, Production of aggregate base course material, Production of RC pipe, Embankment, Bridge, Installation of box and cross pipe culverts works 	Sinohydro
CW-B2 (CBF)	Not yet due	-	-	-	-
CW-C (PR150B, NR53, PR151B)	18,671,259.25	from Sep 2014 to Aug 2017	20.58	<ul style="list-style-type: none"> - January to June 2015: Site camp, De-Mining/UXO, Production of RC pipe, Clearing & Grubbing, Embankment works - July to December 2015: Site camp, De-Mining/UXO, Production of RC pipe, Embankment, Installation of cross pipe culverts works 	Gumkang-Visvakam JV
CW-D (Climate resilience)	Not yet due	-	-	-	-

Source: Monthly Progress Report No. 36 in December 2015 (KCI)

2. Environment Monitoring Mechanism

2.1 Introduction

15. Environment Monitoring Mechanism were established for mitigation measures and taken action on adverse environmental impacts during project's implementation, as full implementation of the IEE, and EMP of the project. Therefore, the environmental specialists (National Environmental Specialist) were mobilized for preparation of the 2nd semi-annual environment monitoring report of the civil works from 18th January to 17nd February 2016. The report represented the activities of the contractors on the project sites in order to ensure compliance with ADB's Social Safeguard Policy Statement 2009. During site inspection, the DDIS consultants and the contractor's representatives were arranged for discussion meeting, at that time Local authorities and affected people who are living along the road project were short interviewed as well.

2.2 Environmental Management Plan (EMP) and CEMP

16. An EMP (Environmental Management Plan) was included in the bidding documents of civil works during the procurement stage. The contractors were required to consider the requirements of the EMP when submitting their bids as the conditions in the EMP become contractually binding on the contractors.

17. The EMP included in the bidding documents is, of necessity, general in scope. This is because specific details such as location of contractors camps, borrow pit areas, batching plant, rock sources, crushing plants and the like are not known at the bidding stage. These details must be supplied by the contractor in his CEMP – Contractors Environmental Management Plan. All contractors had previously supplied a CEMP. This CEMP for the subprojects has been prepared to deal with mitigation and management measures to be taken during Project implementation to avoid, reduce, mitigate for adverse environmental impacts in compliance with the IEE and EMP in the Contract Documents.

2.3 Environmental Monitoring Program

18. The Environmental Monitoring Program is included in the Environmental Management Plan and so the EMP can be considered as an EMMP - Environmental Management and Monitoring Plan. The major tasks for the environmental monitoring in construction stage include:

- Reviewing of the environmental report in previous month that prepared by contractors;
- Field monitoring on contractor's environmental mitigation measure performance in all Subprojects;
- Guidance to MPWT's staff/PMU3 and Contractor's environmental engineers on environmental monitoring aspect, in the field practice;
- Recommend to the Contractors to implement all EMP as stated in IEE report and other environmental safeguards in construction contract documents.

19. The main purpose of environmental monitoring is to ensure that the environmental

impacts of project activities are adequately addressed and mitigated. In addition, the project also needs to comply with ADB's SPS 2009 and Cambodia's environmental laws as indicated in the loan agreement. The contractors have a duty to comply with the relevant legislation. The DDIS consultant must check their activities and report to MPWT. In the event of non-compliance issues related EMP implementation, the DDIS Consultant can instruct the contractor to comply with the environmental safeguards guideline. Given the nature of the work activities most monitoring is based on visual observations.

2.4 Measurements

20. Measurements system is a very important component to measure the progressive works especially during the construction stage. It may be necessary to carry out measurements to establish if the regulations are being met. There will be a "hierarchy" of monitoring and measurements. This would be based on measurements being made by persons in the following order:

- Contractors
- Consultants inspectors
- SEO, environmental staff from MPWT
- Ministry of Environment (MOE would only be involved if an official complaint was made to them)

21. Initially, contractors are required to check daily that all operations are being conducted correctly. In general "good housekeeping" must be employed. If contractor's camps are established, then overflowing of septic tanks must be checked by visual inspection. Dust must be controlled by covering of stockpiles and water sprays. Solid waste, engine oil and grease, must be taken away by waste removal contractors and records kept. For road construction operations, lack of dust suppression and noise control are usually the main sources of potential nuisance if activities take place near residential dwellings. Crusher plants and borrow areas can also be sources of noise and dust. Inspection of borrow areas should also include borrow roads used by contractors vehicles. After extraction from borrow areas is finished, reinstatement must be carried out. Warning signs must be erected to avoid drowning if deep ponds are left. Inspectors and SEO staff must make regular checks by visual inspection.

22. Checklists were established and controlled by Construction supervision inspectors, they are making daily spot checks and weekly formal checks on site operations. They check all of the above and view records for waste disposal. They must also investigate any pollution incidents and also taken action in all complaints from residents/Local Authorities if necessary. They are using checklists for record purposes and ensure that any complaints or incident are brought to the notice of the contractor immediately, verbally and with a follow up written notice.

23. Initial monitoring is based on visual inspection and site assessment. Normally, implementation of "Good Housekeeping" and the contractor demonstrating a responsible attitude are sufficient to ensure an environmentally satisfactory operation.

24. The results must be submitted to SEO who will interpret them with respect to the relevant regulations. Discussions must then be held between SEO, the consultants'

inspectors and the contractor to determine how to resolve any problems.

2.5 Timing of Monitoring

25. The timing of the monitoring is very important for taken action on time. The following list is for guidance and is indicative only.

- Liquid emissions from sites must be checked at least weekly for the Contractors and monthly for the DDIS Consultant or after heavy rain if overflowing is reported.
- Dust emissions on site must be checked weekly by visual inspection and monthly by examining records of water spraying. Ambient air quality must be checked over a 24h continuous period at sensitive receptors in the event of complaints.
- Noise levels must be checked at site perimeters in the event of a complaint, at night as well as during the daytime.
- Correct removal and disposal of food waste and waste engine oil and grease must be checked weekly by visual inspection of the camps and checking of records from the waste disposal contractors.
- Noise and vibration must be checked at sensitive receptors if blasting occurs or in the event of complaint. Before blasting commences warning notices must be posted to local residents.
- Reinstatement of borrow pits and quarries must be checked after closure of the facility.
- Implementation of EMP will be checked weekly by the Contractors and at least once a month, and preparation of semi-annual environmental report by the DDIS Consultant, and semi-annual. Contractors and the DDIS Consultant, as well as SEO have to carry out the last EMP monitoring checklist approval.

26. In addition to regular monitoring, unannounced spot checks must be made by SEO on contractors operations. All of the above procedures should be carried out by the site inspectors, in conjunction with SEO, and where appropriate MOE/ DOE. The results should be formally recorded every week and compiled into a monthly report. This should be submitted to the Engineer, the Chief Resident Engineer and discussed with SEO and the contractors as necessary but at a minimum on a monthly basis. Monthly reports are being compiled into semi-annual reports for submission to ADB.

2.6 Monitoring of CEMP by Checklists

27. The CEMP is monitored and enforced by the Supervision Consultants inspectors who use Checklists included in the EMP. By using the checklists consistency is maintained between the various packages. The checklists are compiled every month and the checklists for all Contract Packages for 1) CW-A: Improvement of NR31; 2) CW-B1: Improvement of PR314D; 3) CW-C: Improvement of PR150B, NR53, and PR151B. In general the semi-annual environmental report is conducted every 6 months (two times per year) by compiling monthly reports. Site inspection of all Environment aspects were sighted and reviewed by the National Environmental Specialist.

28. The checklists had been filled in correctly and reporting was thorough. No significant environmental issues were identified. Dust from roads was commented upon during dry patches but was not a significant issue and was remedied by increased frequency of water sprays. During the rainy season it ceases to be an issue. However, much dust has been generated during monitoring. No noise complaints had been received. However, further remedial work for cement stabilized batching plant on NR13 and dust impact is required at the time of the inspections. No complaints from villagers were reported. Where possible contractors rent local houses for their workers rather than establishing camps. This is easier for them and avoids issues over sanitation and water supply. This approach is actively encouraged and appears to be working well during construction stage.

2.7 Establishment of SEO

29. Social & Environmental Office (SEO) is a division which has been established in the Department of Planning, MPWT. There is now 5 staff within Social and Environmental Office (SEO): 1 Chief, 1 Vice chief, 1 Resettlement, 2 Environment & Social Safeguards. It is considered that this now makes them effective. SEO can act together with the DDIS consultant or independently to check contractor's activities. In the event of non-compliance issues related EMP implementation, SEO as part of MPWT can instruct the contractor to comply with the environmental safeguards guideline. During site inspection on Environmental Monitoring, the SEO should have cooperated with National Environmental Specialist if time availability.

3. Results of Environmental Monitoring

30. The 2nd Semi-Annual Environmental Report focuses on adverse environmental issues and mitigation measure were described in following paragraph, and the field record is included environmental monitoring checklist data from July to December 2015 attached in **Appendices**.

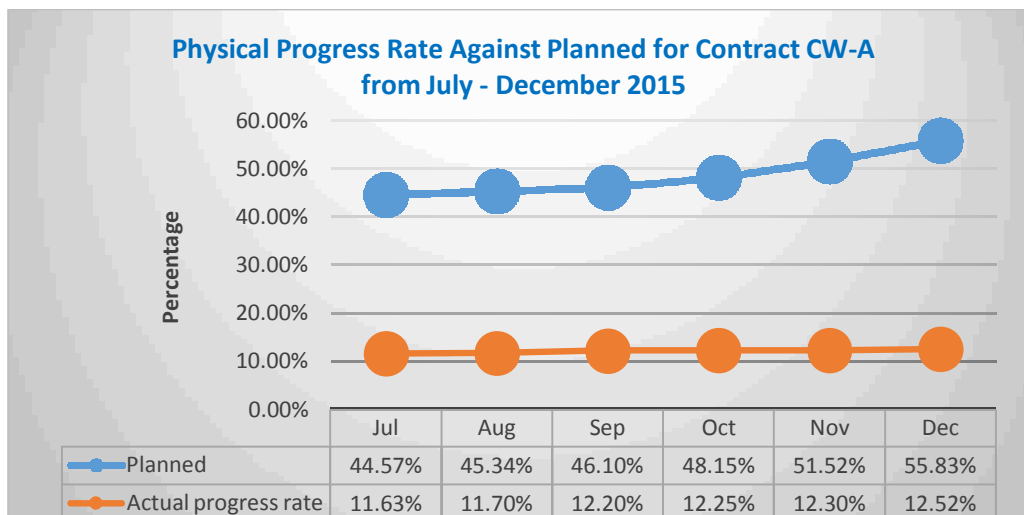
31. To verify the environmental assessments done by checklist, site visits were conducted to several selected roads by the National Environmental Specialist and cooperation with Resident Engineer, ARE of the subprojects and also Contractors. The results of site observation are given in below:

3.1 Contract CW-A: Improvement of NR13 in Svay Rieng and Prey Veng

32. **CW-A** is the subproject for improvement of NR13 and other structure works along the National Road No.13, the starting point of the project at the junction of NR8 (PK 0+000), in Prey Veng province, and end point at the junction of NR1 (PK62+430) in Svay Rieng province, referring to the Specification, this subproject will be upgraded to DBST road of 62.4km and reconstruction of other road structures. SINOHYDRO Corporation Limited Co., Ltd is the Contractor for the project. Construction works commenced on 1st September 2014 and the expected completion date in August 2017.

33. Site inspection indicates that all the construction work activities are progressing slowly against planned, i.e. by December 2015 the embankment works of CW-A just have completed around 20% from PK26+000 to PK39+000, and from PK55+000 to PK62+000. At

the time, most of road structures nearly completed. On the other hand, the Monthly Progress Report No.36, December 2015 shows that the work outputs for this subproject is on-going, however; the accumulated monthly progress by December 2015 was only 12.52% against the planned 55.83%. So -43.31% is behind of the scheduled. Detail of monthly progress rate of this contract (from July to December 2015) against planned are shown in the below figure.



Source: Monthly Progress Report No. 31 to 36 in July to December 2015 (KCI)



Figure 1: Embankment works at end point of NR13, date 20 January 2016



Figure 2: Embankment work activities at NR13, date 20 January 2016



Figure 3: Embankment works at PK61+000, date 20 January 2016



Figure 4: Activity of embankment works at NR13, date 20 January 2016

34. Leaks and spills of hazardous material: The fuel storage facilities at SINOHYDRO's site camp are well managed. Both fuel storage facilities had an in charged person for daily operation and maintained with security and safety.

35. Soil erosion: In general, no sign of soil erosion during the site monitoring, most of the embankment works along this road are far away from the water courses. On the other hand there had not earth work along the embankment at all due to this period no heavy rains.

36. Borrow pits/quarries: By December 2015, there are 6 numbers of samples were tested for the cement stabilized sub-base mixing soil and 4 borrow pits have been approved. However, during site inspection, one borrow pit is selected to check environmental issues at PK 48+300 at RHS (attached field photos as below).

37. Based on the actual site indicates that the Contractor did not install a preventing fence/warning signs around the borrow pit as shown in photos below.



Figure 5: Borrow pit at PK48+300 (RHS), date 20 January 2016

Figure 6: Borrow pit at PK48+300 (RHS), date 20 January 2016

38. Water quality: During field observation, no signed of water laden into the rice field or water body nearby the embankment of the construction road, due to very small track work and drainage system under construction.

39. Dust generation: During embankment works, dust generation was observed. The Contractor's regular sprinkling of water is being done at least two times per day at that time (see in Figure 7 and Figure 8). However, the number of water spray truck is inadequate to effectively mitigate the heavy dust generation along the project road.



Figure 7: Regular sprinkling water was being done at NR13, date 20 January 2016



Figure 8: Regular sprinkling water was being done at NR13, date 20 January 2016

40. Waste management: The workshops and storage areas in Site Camp of the Contractor have been improved and equipped with garbage bin. The platform space of Contractor site camp is well cleaned. Most of the construction sites are well managed of solid waste as well as spoil soil. However, next to the site camp, there are stockpiled material of base course encroached the road shown in figure 10.

41. In general, no environmental issues were observed excepted heavy dust generation on the site.



Figure 9: Good environment in/around the Contractor's site camp at PK58+400



Figure 10: Material stockpile along the project road, 20 January 2016

42. Safety: All the workshops and storage places have been equipped with extinguisher capacity of 4kg (at least 4 bottles). During the monitoring, an inappropriate location of batching plant along NR13 within a residential area without any approval and permission from DDIS consultant and Commune is observed as a non-compliance issue related to the EMP implementation.



Figure 11: Cement stabilization batching plant along NR13 at PK 55+400, 26 January 2016



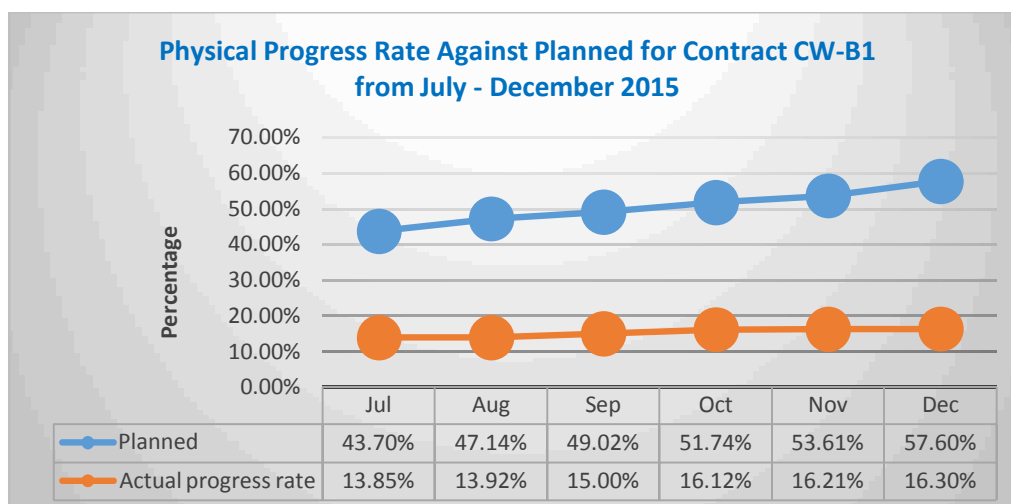
Figure 12: Cement stabilization batching plant without fence along NR13 at PK 55+400, 26 January 2016

3.2 Contract CW-B1: Improvement of PR314D in Svay Rieng

43. PR314D of 25.5km length is being constructed under Contract CW-B1. The road CW-B1 is under proceeding clearing and embankment work, and the activities were observed from PK 15+500 to PK 20+000. The bridge No.1 at PK 23+00 is completed De-Mining/UXO work in January 2016, the Bridge construction will be proceed in the next month.

44. Related the EMP implementation, Environmental monitoring of this subproject (CW-B1) were inspected on 20-21 January 2016. The status of this Sub-project is under construction, but the progress of work is very slowly against the scheduled, Resident Engineer (Mr. THANAWICH Nithis) confirmed during discussion meeting in KCI's office at Svay Rieng province. Earthwork activities were observed during site inspection from PK 15+500 to PK 20+000, while the embankment work is in progressing from PK0+800 to PK15+500.

45. Basically, accumulated monthly progress of the contract CW-B1 in this month is 16.3% against planned 57.6%, therefore -41.3% delayed of the planned. The Contractor is requested to update construction plan. Detail of monthly progress rate of this contract (from July to December 2015) against planned are shown in the below figure.



Source: Monthly Progress Report No. 31 to 36 in July to December 2015 (KCI)



Figure 13: Discussion meeting with RE for CW-A, CW-B1, date 20 Jan 2016



Figure 14: Earth work activities at NR314D for PK 15+500 to 20+000, date 20 Jan 16

46. For this subproject, a total of 47 numbers borrow pits samples were tested for the embankment material and 27 borrow pits have been approved. 2 numbers of quarry samples were tested for the base course material and 1 quarry has been approved. During the site inspection of CW-B1, one borrow pit were selected by random for conducting checklist related to the EMP implementation. Contractor did not install a preventing fence/warning signs around the borrow pit as shown in photos below.



Figure 15: Borrow pit at PK17+000 (LHS), date 20 January 2016



Figure 16: Borrow pit at PK17+000 (LHS), date 20 January 2016

47. Water quality: During field observation, no signed of water laden into the rice field or water body nearby the embankment of the construction road, due to very small track work and drainage system under construction.

48. Dust management: The embankment work for CW-B1 is in progress, therefore the heavy dust generation was observed. During the site inspection, the Contractor try to do regular sprinkling of water at least two times per day, however; the number of water spray truck is inadequate to effectively mitigate the heavy dust generation along the project road (see in Figure 17 and Figure 18).



Figure 17: Regular sprinkling water was done at PR314D, date 20 Jan 2016



Figure 18: Road after sprinkling water was done at PR314D, date 20 Jan 2016

49. Leaks and spills of hazardous material: The fuel storage facilities at PR314D for CW-B1 were separated from the other material storages to avoid any riskiness and the station is in good installation (this station now is under construction, concrete platform and wall, and security equipment and fence), see figure 19 & 20. The station had an in-charged person for daily operation and maintain including security and safety.

50. The monitoring work in this month found that the fuel storage places for CW-A & CW-B1 stations are well managed of leakage fuel, no sign of spillage on the ground and on the concrete floor.



Figure 19: Fuel Storage facilities is under construction for CW-B1, date 20 January 2016



Figure 20: Temporary fuel storage facilities at PR314D, date 20 January 2016

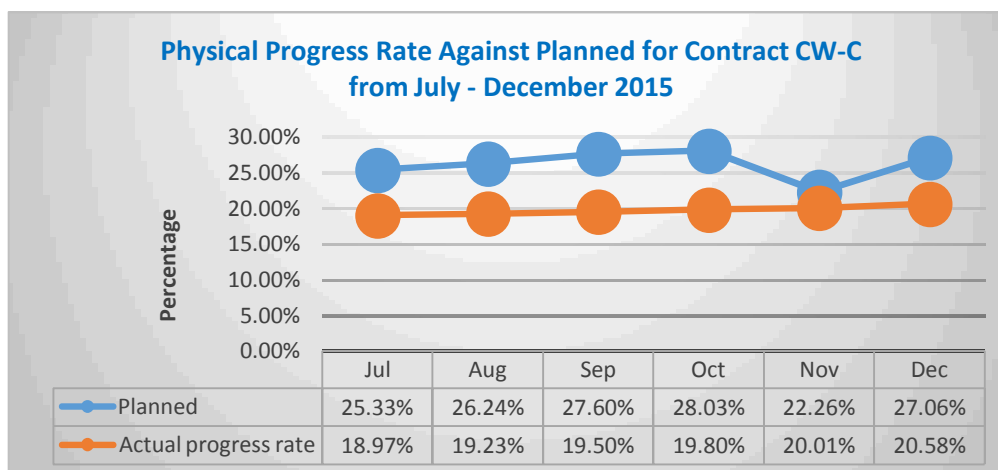
51. The liquid waste generation from the project is wastewater from the bathing and flushing toilet. Generally, the workers camp is equipped with bathing room and toilet. The bathing water is drained into the storage tanks. The toilet is built separated between men and women.

52. This workers camp is complying with the CEMP. The contractor and the KCI inspector are to be complimented on their efforts. However, the progressing works is slow because of no work activity is happening as URP activities need to be completed soon, by February 2016.

53. No adverse environmental issues were observed at the site.

3.3 Contract CW-C: Improvement of PR150B, NR53 and PR151B

54. Based on the actual site inspection and reviewing of monthly progress report, it is indicated that the contract is slow progress at a progress rate of 20.58% against updated plan of 27.06% (the plan has been updated on November 2015). Detail of monthly progress rate of this contract (from July to December 2015) against planned are shown in the below figure.



Source: Monthly Progress Report No. 31 to 36 in July to December 2015 (KCI)

55. Waste management, during site observation in January 2016, most of the Contractor's camp sites are well managed solid waste. The garbage bins/recycle bins at work sites and the contractor's office were equipped. The solid waste management at the Consultant's site camp, however; were improved since the comments in previous report (the 1st SEMR), and also equipped with garbage bins/recycle bins at the place. The contract with the Local Authorities/Company to collect and dispose this solid waste generated from all activities to dumping area has been done.

56. Leaks and spills of hazardous material (main contractor): The contractor's camp was inspected during monitoring. In general, housekeeping is well managed. The fuel storage facilities for CW-C are in good installation (concrete platform and wall, and security equipment and fence), shown in figure 27 & 28. Both stations had in charged person for daily operation and maintain including security and safety. The monitoring found that the fuel storage placed in CW-C (main contractor) is well managed against leakage fuel, no sign of spillage on the ground and on the concrete floor.



Figure 21: Fuel storage facilities are good condition at the main contractor's site camp



Figure 22: Properly Material storage in the workshop at the main contractor's site camp

57. Leaks and spills of hazardous material (sub-contractor): Improper oil/fuel container storage or change engine oil was carried out inappropriately, and this place is also closed to the primary school (Andong Tramoung primary school) at PK 8+200 of PR150BW (figure 23 & 24). The contractor should have provided a suitable tank, including built concrete platform, wall, and security equipment and fence around the fuel storage. At the workshops and storage area, it was observed that (i) improper oil/fuel drum storage, (ii) insufficient housekeeping.



Figure 23: Improper oil/fuel drum storage for PR150BW, at PK8+200, on 19 January 2016



Figure 24: Improper oil/fuel drum storage for PR150BW, at PK8+200, on 19 January 2016

58. Soil erosion: In general, no sign of soil erosion along the construction road (CW-C: NR53; PR150B; and PR151B) during the site monitoring.

59. Borrow pits: Total 254 numbers of borrow pits sample were tested for the embankment material and 141 numbers of borrow pits have been approved. 5 numbers of borrow pit sample for sub-base material were tested and 1 number of borrow pit has been approved. 2 numbers of quarry samples for base course material were tested and there was no approved quarry up to this period. One borrow pit were selected to check related the EMP implementation during site inspection, it is observed that the Contractor uses all borrow pits have already approved for construction materials.

60. Interviewing with borrow pits' owner indicates that some borrow pits be utilized for aquaculture or developed as water reservoir for community use, however; most of the borrow pits did not install the prevention fence/warning sign to prevent any accidents may be accused. The Contractor will responsible for rehabilitating any borrow sites opened and operated by them.



Figure 25: Borrow pit was requested by owner to fish raising purposed at PK6+300



Figure 26: Borrow pits for PR150BW is not yet improved or re-fenced at PK14+500

61. Water quality: During field observation, there was not signed of water laden into the rice field or water body, due to the earthwork activities was carried out by place. The clearing & grubbing and earthwork activities of NR53 have been resumed, but no soil erosion were observed due to the dry season. In general, the embankment work was not proceeding smoothly due to inaccessibility to borrow pits. Scarifying and compaction work for the succeeding layer is ongoing during this monitoring.

62. Air pollution: Project is a provincial road improvement where not much air pollution to be caused serious adverse impact to community except dust impact. Dust generation was observed along the project road during site inspection, while water spray trucks are standby on the road, due to some of water sources in this area are being insufficient. Those water sources are kept for local people uses during the dry season only. So, the Local Authorities did not allow pumping those water sources. Therefore, the Contractor should be taken action to solve this issue by finding other water sources for water sprinkling at least 2 times per day. Water spraying should be focused on populated areas and sensitive locations such as school zones, residential areas and health care centers.



Figure 27: Water spray truck is being stand by along the PR150B-W



Figure 28: Interviewing with water spray truck 's driver at PR150B-W

63. Safety: All the workshops and storage places have been equipped with extinguisher capacity of 8kg (at least 2 bottles). And first aid kits were equipped in the site camp as well.



Figure 29: Extinguisher were equipped at the contractor's site camp, date 19 January 2016



Figure 30: First aid kits were equipped at the contractor's site camp, date 19 January 2016

64. Traffic Safety: On date of the field observation, the monitoring team did not see any traffic congestion as well as accident that caused by the project activities. Most of the construction activities area equipped with warning signed. However, it is observed that warning signs and safety devices are absolutely insufficient for the road safety. Also, signs to reduce traffic speed should be in place at the dangerous areas such as deep excavations and narrow areas.

65. No major adverse environmental issue was observed on the site. However, the contractor is neglected to take the correct action for the non-compliance of EMP implementation which has been addressed on November 2015 after ADB Loan Review Mission even though DDIS consultant continuously reminded contractor to take correct action.

66. Clearing and grubbing is ongoing along the PR151B and PR150B-E, however, warning signs and traffic safety barriers are not installed sufficiently. (See in Figure 31 and Figure 32).



67. In general, the status of PR151B and 150B-E, there was not signed of water laden into the rice field or water body nearby the clearing and grubbing works.

68. Therefore, CW-C: Improvement of PR150B, NR53, and PR151B, in actual site has no major adverse environmental issues. The contractor's activities were considered partially satisfactorily.

4. Review of Environmental Parameters

69. Environment parameters were checked and reviewed for three contract packages. All civil works have been evaluated satisfactory and no major environmental issues were found except cement stabilized batching plant in CW-A contract package. The reviewing of results on environmental parameters of each contract package is shown in **Table 3**.

Table 3: Environmental Parameters Contract Packages CW-A, CW-B1, CW- B2, CW-C, and CW-D

Regulation	Environmental Issue	Parameter	Standard	Contract Packages CW-A	Contract Packages CW-B1	Contract Packages CW-B2	Contract Packages CW-C	Contract Packages CW-D
ADB requirement	Notification of EMP to contractors	General requirements	ADB Social Safeguards Policy Statement 2009	Completed. EMP included in Tender Documents issued to contractors.	Completed. EMP included in Tender Documents issued to contractors.	N/A	Completed. EMP included in Tender Documents issued to contractors.	N/A
ADB requirement	Submission of CEMP from contractor to MPWT	Specific details must be supplied by contractor on construction camps, borrow areas and roads, quarries, crushing and screening plants.	ADB Social Safeguards Policy Statement 2009	Submitted by contractor. NR13 completed.	Submitted by contractor. PR314D completed.	N/A.	Submitted by contractor. PR150B, NR53, PR151B Completed	N/A
EMP requirement	Monthly Checklists	All environmental parameters	As per individual checklists given in EMP	Checklists completed by Engineer with contractor for July to December 2015. Checklists reviewed and confirmed to be in order. No environmental issues identified except cement stabilized batching plant.	Checklists completed by Engineer with contractor for July to December 2015. Checklists reviewed and confirmed to be in order. No environmental issues identified.	N/A	Checklists completed by Engineer with contractor for July to December 2015. Checklists reviewed and confirmed to be in order. No environmental issues identified.	N/A
Sub-decree on Water Pollution Control	Water Quality	BOD	< 50mg/L	No visual evidence was sighted of impacts on water quality. No spills were observed. There are no major water courses near project roads. No remedial action is required. No sampling or measurements of water is required.	No visual evidence was sighted of impacts on water quality. No spills were observed. There are no major water courses near project roads. No remedial action is required. No sampling or measurements of water is required.	N/A	No visual evidence was sighted of impacts on water quality. No spills were observed. There are no major water courses near project roads. No remedial action is required. No sampling or measurements of water is required.	N/A
		SS	< 50mg/L					
		Temperature	<45°C					
		pH	6-9					
		Oil & Grease	< 5mg/L					
		Dissolved Oxygen	> 4mg/L					

Regulation	Environmental Issue	Parameter	Standard	Contract Packages CW-A	Contract Packages CW-B1	Contract Packages CW-B2	Contract Packages CW-C	Contract Packages CW-D
Sub-decree on Air and Noise Pollution Control	Air Quality	TSP	< 0.33 mg/m ³	No major air quality issues identified. Dust suppression on roads improved by more water spraying. Minor noise issues cured by controlling speed of vehicles.	No major air quality issues identified. Dust suppression on roads improved by more water spraying. Minor noise issues cured by controlling speed of vehicles.	N/A	No major air quality issues identified. Dust suppression on roads improved by more water spraying.	N/A
	Noise Quality	Leq	75dB(A)					
		Leq	65dB(A)					
No Regulation	Vibration	PPV	< 1mm/sec	No blasting taking place. Blasting will be carried out by commercial quarry owner with permission of local commune	No blasting taking place. Blasting will be carried out by commercial quarry owner with permission of local commune	N/A	No blasting taking place. Blasting will be carried out by commercial quarry owner with permission of local commune	N/A
Sub-decree on Solid Waste Management	Solid Waste	Food Waste	Properly Removed	Site camps acceptable. Attention to be given to oil storage and handling.	Site camps acceptable. Attention to be given to oil storage and handling.	N/A	Site camps acceptable. Attention to be given to oil storage and handling.	N/A
	Liquid Waste	Waste Oil, Grease	Properly Controlled After Removed by Subcontractor					
No Regulation	Septic Tank	Smell, Sewage	No Smell, No Overflowing	Workers camps acceptable. Where possible houses are being rented rather than setting up camps.	Workers camps acceptable. Where possible houses are being rented rather than setting up camps.	N/A	Workers camps acceptable. Where possible installed on the residential land are being rented for setting up camps.	N/A
No Regulation	Borrow Pits	Condition of Borrow Pits	Filled after Project Completion, Topsoil resurfaced	No issues identified. But shall be fenced after Project Completion	No issues identified. But shall be fenced after Project Completion	N/A	No issues identified. But shall be fenced after Project Completion	N/A
No Regulation	Borrow Pits	Depth of Borrow pits	No Drowning Hazard	No issues identified	No issues identified	N/A	No issues identified.	N/A
No Regulation	Borrow Road	Location for Borrow Road	No complaints from residents	No issues identified	No issues identified	N/A	No issues identified.	N/A
No Regulation	Quarries	Condition of Quarries	Quarries reinstated	N/A	N/A	N/A	N/A	N/A
No Regulation	Trees if Cut	Number of Trees	Tree Replanted	N/A	N/A	N/A	N/A	N/A

5. Corrective Actions

70. Most of the Corrective Actions are complying with the CEMP, and also implemented by the Contractor, while the other minor non-compliance issues will be corrected from February 2016.

6. Outstanding Issues

71. There are outstanding issues involved in environmental management in CW-A and CW-C contract package.

72. CW-A: There is a major outstanding issue to the cement stabilized batching plant to avoid noise and dust negative impact to the resident due to located at residential area. The contractor is requested to take correct action to mitigate negative impacts such as installation of protect wall and noise / dust control during the operation of plant. Location to be installed should have taken approval from DDIS consultant and local commune as well.

73. CW-C: The contractor should have taken correct action to the non-compliance of EMP implementation which has been addressed by DDIS consultant and ADB Loan Review Mission as well.

7. Conclusion

74. All above results of the semi-annual environment monitoring to the ongoing civil works of the Project observed no significant impact. However, outstanding issues have been found to the CW-A and CW-C contract package. The Contractor shall implement the environmental management and mitigation measures in compliance with the EMP/CEMP properly.

75. Related to the EMP implementation, air pollution mitigation has been carried out continually to reduce dust generation and gaseous emissions from road construction work activities and machineries by the Contractor at the construction sites. Among of monitoring items, worker camps and quarry & borrow pit sites operation are the most important to determine the effects of the project activities. As the results of the monitoring on site camp of the Contractor for CW-B1 and CW-C are in good condition, moreover, there are no any environmental issues or influences caused by those sub-projects during construction stage. Therefore, the construction activity has been continually carried out strictly follow the environmental monitoring in the EMP and CEMP and other relevant environmental contracts. DDIS consultants' field monitoring to ensure compliance with the requirements in the EMP and CEMP shall be implemented frequently and closely whether the contractor's field activities are compliance with the requirements in the EMP and CEMP.