Semi-annual Report

September 2016

PNG: Highlands Region Road Improvement Investment Program (Project 2)

Kotna to Lampramp Sub Road Project

Prepared by Department of Works for the Asian Development Bank.

Loan Number: 3076/3077 PNG.

Project Number: 40173-043.

Report: Semiannual.

HIGHLAND REGION ROAD IMPROVEMENT INVESTMENT PROGRAM – PROJECT 2

Kotna to Lampramp Sub-Road Project

ENVIRONMENTAL SAFEGUARDS MONITORING REPORT

(January to June, 2016)

Project Implementation Unit

Department of Works

National Capital District

Papua New Guinea

September 2016

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Abbreviations

ADB	-	Asian Development Bank
AP	-	Affected People
CAR	-	Corrective Action Report
CEMP	-	Construction Environment Management Plan
CRO	-	Community Relations Officer
CSC	-	Construction Supervision Consultant
DBST	-	Double Bitumen-layer Surface Treatment
DC	-	Design Consultant
DOW	-	Department of Work
EA	-	Executive Agency
EMP	-	Environmental Management Plan
EO	-	Environmental Officer
ESSU	-	Environment and Social Safeguards Unit
GoPNG	-	Government of Papua New Guinea
GRC	-	Grievance Redress Committee
HCRN	-	Highland Region Core Road Network
HIV	-	Human Immunodeficiency Virus
HRMG	-	Highland Road Maintenance Group
HRRIIP	-	Highland Region Road Improvement Investment Program
IA	-	Implementation Agency
IEE	-	Initial Environment Examination
ISS	-	International Safeguards Specialist
LLG	-	Local Level Government
MFF	-	Multi-tranche Financial Facility
MOA	-	Memorandum of Agreement
NRA	-	National Road Authority
PNG	-	Papua New Guinea
PPE	-	Personal Protective Equipment
PRO	-	Public Relations Officer
PWM	-	Provincial Works Manager
ROW	-	Right of Way
RP	-	Resettlement Plan
SHP	-	Southern Highland Province
SIS	-	Socio-economic Impact Study
SPS	-	Safeguard Policy Statement
STD	-	Sexually Transmitted Diseases
TOR	-	Terms of Reference

1.0 Introduction

1.1 Background

1. The Highlands Region of Papua New Guinea (PNG), comprising of the Provinces of Western Highlands, Jiwaka, Southern Highlands, Hela, Eastern Highlands, Enga and Simbu. These provinces make major contribution to the PNG economy through their agricultural production and mineral resources. A well maintained road network is essential to facilitate the movement of goods and people. The Government of PNG (GoPNG) has made significant investment in improving the road network but a lack of maintenance has resulted in deterioration of the roads such an extent that the Highlands Core Road Network (HCRN) is now in poor condition.

2. In order to address the deterioration of the HCRN there is a clear need to: (i) implement a program of regular maintenance on all HCRN roads that are in good condition; and (ii) improve those roads that are in poor condition and ensure that maintenance begins on those roads as soon the improvement works are completed.

3. The GoPNG has negotiated a Multi-tranche Financing Facility (MFF) loan with the Asian Development Bank (ADB) to implement the Highlands Region Road Improvement Investment Program (HRRIIP). The HRRIIP includes projects to improve the HCRN, the preparation of long-term maintenance contracts for the HCRN, and the capacity development of road agencies. In total, 13 road sections are expected to be funded under the program. The Execution Agency (EA) for the program is the Department of Works and Implementation (DOW) and the Highland Road Maintenance Group (HRMG) is the Implementation Agency (IA) for road improvement works whilst the National Road Authority (NRA) is the IA for road maintenance works.

4. Tranche 2 (*herein* Project 2) include improvements to three road sections in the highlands region of PNG namely, Mendi-Tambul (55.53km), Kotna-Lampramp (31.65km) and Ialibu-Kagua (32km) in between the Southern Highlands and Western Highlands Provinces, respectively.

5. The rehabilitation of the Kotna - Lampramp road is one of the 13 projects supported through the above loan. The contract for construction has been awarded to COVEC (China) Limited where the contractor was given permission for site occupation on the first of February 2016. The construction period for the project is 24 months. It was expected that the project will be completed by 1st February 2018.

6. The defects liability period of one year begins after this date. Once the road is built, it will provide an effective link with Mul Baiyer and Dei district in the Western Highlands Province. It also connects North Waghi and Anglimb South Waghi in the Jiwaka Province. After the end of defects liability period, a program of maintenance of ten years commences.

1.2 Project Description

7. Kotna – Lampramp road section is 31.6 km long that connects Jiwaka and Western Highlands Provinces. The construction work of this road section included up-grading of the road that was built in the 1970s. The project duration is 24 months.

8. The road consists of a 5.5 metre sealed carriageway with 0.25 meter gravel shoulders on either side together with all road furniture as per the design. The subproject work confines to the existing road corridor and direct impacts are within the edge of the existing road and the construction limits.

9. The most part of existing road is situated on customary land and the use of which has been agreed in consultation with the clan leaders and communities that jointly own the land via a Memorandum of Agreement (MOAs) permitting the use of customary land for public infrastructure.

10. The environmental impacts assessed at the time of preliminary design categorised the subproject as Category B for environment. This category was confirmed by the in-depth environmental analysis conducted at the time of project preparation. The Initial Environment Examination (IEE) was approved in 2013 and disclosed in the web site. The IEE confirmed that environmental impacts of the rehabilitation of the Kotna – Lampramp road are limited to the road corridor, which are of minor scale and any adverse impacts can be mitigated through the thorough implementation of the measures contained in the environment management plan. The impacts such as dust, noise, materials sourcing, storage, haulage, soil erosion, sedimentation and run-off are likely to occur mainly during the construction phase.

11. Based on the EMP presented in the IEE, a construction environment management plan (CEMP) was prepared by the contractor in February 2016. This CEMP was prepared well before the contractor is mobilised on site.

12. Prior to this, the contractor was provided with training in both CEMP preparation and its monitoring, delivered by the PIU Specialist in collaboration with the Environment and Social Safeguards Unit (ESSU) of DOW. The CEMP was reviewed and finally approved in April 2016. The contractor training took the form of workshops, site visits and meetings. The workshop in February 2016 was to fix conditions of CEMP attended by the contractor staff, HRMG and Construction Supervision Consultant (CSC)'s staff. According to pre and post evaluations conducted, it was revealed that few employees have had basic knowledge on CEMP preparation and its monitoring. The two training sessions delivered in March and April were on CEMP monitoring and reporting. Several monitoring tools such as checklist, site visits, public consultations and group discussions have been employed by the EOs, OHSO, CROs and SSO.

13. The construction work began on 14th March 2016 with the establishment of contractor's workers camp at the village called Tigi. It is located near the project site and where most of the implementation activities are taking place.

14. Internal monitoring was undertaken by the environmental specialist from the Construction Supervision Consultant (CSC) and Environmental Officer (EO) for HRMG, overseen by PIU's safeguards specialist. Monthly monitoring reports have been prepared by the contractor for verification by the CSC. Four of the verified reports have subsequently been delivered to HRMG/ESSU for approval.

1.3 Purpose

15. This report is written to present the status of environment safeguards including the compliance with approved CEMP in respect of the Kotna - Lampramp road section. It also provides an overview of the environmental management process, its outcome and corrective actions as necessary.

16. Quarterly and bi-annual environment safeguards monitoring reports are requirements under the ADB Safeguard Policy Statement (SPS) 2009.

17. This report covers environmental issues and the mitigation measures for the reporting period from January to June 2016.

1.4 Methodology

18. The six-monthly report of January to June 2016 is prepared using data gathered from several sources. The primary data were from discussions with project staff including contractor staff and officials and meetings with the community and site inspections and observations. The secondary data came from monitoring reports and other plans produced by the contractor, reports by CSC and data extracted from contractor's camp log-book.

19. The list of reports reviewed is in Appendix 1 whilst names of people interviewed are in Appendix 2.

1.5 Report Organisation

20. The report consists of three section as follows:

Section 1 – Introduction
Section 2 – Monitoring results and findings
Section 3 – Conclusions and recommendations and the appendices.

2.0 Monitoring Results and Findings

21. The findings of the internal monitoring are presented in this section.

22. The activities for this road section included

i. clearing and grubbing,
ii. cut and fills to provide the designed road formation,
iii. filling and embankments,
iv. works on bridges and culverts,
v. drainage,
vi. sealing of the road with DBST and
vii. the installation of road furniture.

The road construction work required the operation of the camp, 2 material storage areas and 2 quarries, the latter to extract materials required for the base course, sub-base course and embankments.

23. The basis for internal monitoring is the parameters listed in the CEMP of which there are 16 as follows:

i. Contractor's camp and yard
ii. Erosion and sedimentation
iii. Water quality
iv. Air quality
v. Noise
vi. Waste management
vii. Hazardous material management
viii. Aggregates extraction
ix. Tree removal and vegetation management

x. Socio-economic issues (workers)
xi. Socio-economic issues (community)
xii. Public safety
xiii. Health and safety issues
xiv. Traffic management
xv. Prevention of HIV/AIDS and STDs
xvi. Existing infrastructure issues

24. In addition to the above activities, the contactor conducted public consultations and managed grievances related to environment.

25. Discussed below is the status of performance of each of the above 16 parameters as well as community consultations and environmental grievances during the reporting period.

2.1 Contractor's camp and yard

26. The contractor established its camp at Tigi at 17+900 kilometres from Kotna. It is a newly-built site for the purpose of this road construction where 1.3 ha of customary land was secured through an agreement reached in October 2015 between the land owners and contractor. The rent for the land lease is paid to the land owners on a monthly basis. This camp is fully equipped with workers' accommodation, workshop, and office complex and store rooms and vehicle yard.

27. The Tigi camp yard is used for the storage of construction equipment and material stockpile. The camp was fully fenced where the contractor employed local security guards for the protection of machinery and equipment as well as for the control of visitors. The camp provided offices, staff accommodation, equipment storage, kitchen facilities and toilets. Tigi camp is the only camp in tranches 1 and 2 that has provided septic toilets for local employees (Photo 1).

Photo 1 Septic toilet at Tigi base camp

2.2 Erosion and sedimentation control

28. Soil erosion and sedimentation was generated during clearing and grubbing as well as cut and fill areas during the course of improvement works. This was also reported in the relevant monthly reports.

29. The project being on a hilly landscape, inevitably generated soil erosion from cut surfaces, filled areas and other open grounds. In some areas, the soil erosion rate had been high though measurements have not been taken. The contractor adopts various methods such as drains, gabion baskets, cutting benches to slow down erosion and providing line drains and where required lining drains to minimise soil erosion. The success of mitigation measures is in contrast to that proposed, due to geographical and land formation and soil structure where there roads cuts through. In areas with moderate slopes, the control measures are adequate to minimise soil erosion. On the other hand, soil erosion was high and was not effectively managed in areas where the slope had a higher gradient between 6 km and 15 km of the road section.

30. Sedimentation has occurred in streams, agricultural lands and on other pathways. The contractor utilized a number of measures to reduce sedimentation. One of such measures is to prevent discharge of sediment laden construction water or materials directly into the rivers and surface water. All such construction waters have been diverted to lock-and-spill drains. In some cases, drains diverted sediment-laden run off water away from agricultural land and settlement areas.

31. Consultations have been conducted with land owners and village chiefs to identify suitable land-based areas for settling ponds or discharge areas. In spite of above measures, it has not been possible to eliminate sedimentation mainly because of the mountainous terrain of the road section where works implemented during the reporting period.

32. The contractor has been instructed to prepare Corrective Action Report (CAR) in respect to soil erosion and sedimentation control. The CAR is presented in Appendix 3.

2.3 Water quality

33. There are several streams and rivers that are located within the construction zone. Although the water quality of streams and rivers along the road section was not measured before the construction works began, observations revealed lowered water quality in the Angel River where a river-based quarry is in operation (Photo 2).

34. Also, dumping of road wastes along the river caused pollution of river water. The water quality was also found to be low in several other streams in the mountainous section due to excessive run off from landslides along the alignment. The water quality deterioration is mainly due to sediment load. The impacts are temporary as water quality will improve after the completion of works. The contractor has been advised to provide adequate water quality mitigation measures in future. It has also been agreed that the contractor conducts baseline water quality measurement prior to work commencing in other areas.

Photo 2 Turbidity in Angel River from material extraction

35. Near the camp and materials storage yard, there had been reports of low water quality due to the leakage of oil and lubricants into the water. The sewage water from the residential camp had been allowed to escape into the nearby stream untreated. It is not possible to confirm on water quality impacts as the quality was not monitored. All streams and rivers contained clear water free of pollutants before construction works begun, according to visual observations. The contractor has been instructed to prepare the CAR in respect of improving water quality which is in Appendix 3.

36. The natural stream courses and rivers never changed directions. Hence, there was no evidence of significant and long-term impacts on water resources during the review period.

2.4 Air quality

37. Although not measured, the air quality, in general, had been satisfactory. There had been occasions where air quality had been poor due to dust particles produced by movement of vehicles and in quarry sites during the dry season. However, this has been controlled by sprinkling of water to reduce the dust particles blown to houses and trade stores near the road. The air quality in and around quarry sites were reported to be low, mainly due to dust particles and soot generated from construction works and heavy machinery, respectively. The changes in air quality are confined only to the construction months. The contractor has confirmed to conduct air quality measurements in December 2016. The delay is caused by the time it has taken to ship the required equipment from the overseas supplier.

2.5 Noise

38. There were reports from the community on the high noise levels in the construction works area. The contractor managed this impact effectively through the adoption of measures such as frequently checking all machinery and vehicles for noise generation and the fixing of mufflers, etc. In a few instances, at the request of the community, construction works were re-scheduled for day-time. The baseline data on noise levels was not collected. Moreover, noise level was not measured during construction work. The contractor has already been advised to collect baseline data as quickly as possible.

2.6 Waste Management

39. The wastes generated from construction works was of three main types;

i) overburden from construction site,
ii) spoil from quarry sites, and
iii) camp wastes and hazardous material.

40. The over burden generated from road sides was dumped in 9 designated sites at chainage 17+600, 19+700, 20+560, 20+600, 20+700, 21+620, 22+500, 23+00 and 24+00.

41. The dumping sites have been agreed with the clan leaders. In addition, spoils were placed on land and levelled off as requested by several land owners. In such cases, the contractor supplied waste material to land owners and did levelling off free of charge. In few cases, the material has been rolled down the slope of the road alignment thus damaging natural vegetation and streams. Photo 3 shows rolling of road wastes down the slope of the road which is non-compliance.

42. The road waste dumped on coffee gardens near 17 km does not comply with the CEMP (Photo 4). The contractor has been advised to deal with this case and to provide compensation to respective land owners, if required. The contractor has supplied the CAR where it agreed to fix the problem during the next reporting period.

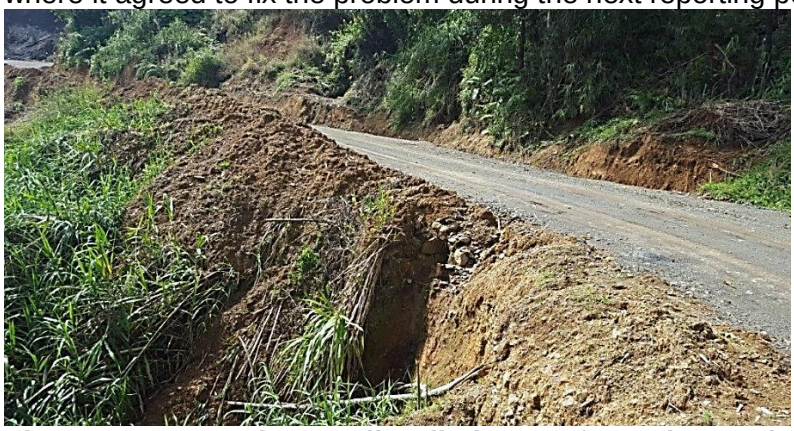

Photo 3 Construction Spoil Rolled Down from slopes above

Photo 4 Spoil placed on Coffee Gardens at 17 km

43. After the reporting of such impacts (see photo 3&4), the contractor was found to have changed its behaviour by dumping wastes in designated areas without causing any harm to the local population or their assets. The dump sites were levelled off and adequate drainage provided upon pointing to the contractor by HRMG staff and the community. The timber off cuts, iron cuts and other material were collected and disposed by the contractor in designated sites.

44. Apart from the improper dumping of spoil referred to above and in stream dumping, the wastes generated from quarry sites were used to fill depressions or placed in designated waste sites. There were no adverse reports from the community with regard to the dumping of quarry wastes.

45. The camp wastes generated in the kitchen were dumped in a pit near 18 km. The contractor has a written agreement with the land owner for this disposal. The fees paid to the land owner for the temporary use of land is Kina 50 per fortnight.

2.7 Hazardous materials management

46. The hazardous wastes which will be generated from construction works are the bitumen, paints and lubricants. All such materials will be contained in the contractor's yard with controlled entry to people. There was no report of any injury or life impairment to community members from hazardous wastes disposal since the project just started and only did clearing and grabbing. Minor leakages of fuel and lubricants from the camp have been removed by the contractor without creating adverse impacts on the environment.

2.8 Aggregate extraction

47. The Kotna – Lampramp road during the reporting period had two quarries, both river based located along the Angel River. Another quarry is about to open which is a land-based quarry. The main river quarry is located 300 meters away from the base camp. All material required for construction works will be extracted from the 4 quarries. The material extracted is transferred to stockpile area where crushing and batching take place. The quarry

management plan for the Angel Quarry site has already been approved and the monitoring is being undertaken during the review period. The quarry management plans for other sites are in the process of preparation.

Photo 5 Gravel Extraction at Angel River Quarry

48. The environmental impact from the 2 river quarries on the downstream was evident as the turbidity level was very high during material extraction. The impacts were obvious as the excavator was working in the middle of the river. As a result, many people living downstream were affected by way of their washing and laundry. A non-compliance report has already been delivered to the contractor who has responded with a CAR in order to rectify the damage (Appendix 3).

2.9 Trees removal and vegetation management

49. A number of trees were removed from the Right-of-Way to pave the way for road construction. Many trees were removed in accordance with the resettlement plan where APs have already been compensated for. In the meantime, there were other trees removed in order to pave the way for construction works. The actual number removed is unknown as there had not been records kept by the contractor who had been advised to correct this issue through proper record keeping. This will be monitored. The contractor will provide seedlings to people along the alignment for planting in order to replace what is being destroyed.

Photo 6 Damage to Natural Vegetation resulting from road spoil dumping

2.10 Socio-economic issues (workers)

50. The CEMP contained socio-economic issues of two types. They are health and safety issues of workers and HIV/STDs control program. The compliance of above issues aspects with the CEMP are discussed below.

2.10.1 Workers health and safety

51. There had not been any adverse reports on workers safety during the period of this review. The entry to camp and yards are controlled by a private security company and the public is not allowed to enter any of the above facilities. All construction workers are required to be present on their respective stations until 6.00 pm. The employees are advised not to engage with the community.

52. All employees have been advised on camp rules including the prohibition of removal of fauna, flora and fuel wood from the local forest areas where there had not been any breaches. Each employee is to be issued with personal protective equipment (PPE) and provide with necessary training as appropriate which has not been complied with.

53. The contractor has placed an order for the PPE which are likely to be available at the site in future. The contractor has already been instructed to expedite the supply of PPE. The weekly tool-kit meetings are conducted at the base camp where all employees are alerted on health and safety issues.

2.10.2 HIV/AIDS and STDs

54. The contractor has prepared a HIV/AIDS and STDs control plan. This had been submitted and cleared by the ESSU. The contractor implemented the Plan where the progress was recorded in monthly reports. The Plan was implemented by two workers trained by the Provincial Aids Control Unit. All workers were provided with basic HIV/AIDS training by the HSO on several occasions and they were also issued with condoms. Training program for the community was also conducted on 25th May 2016 where 110 members received the training. In addition, two sign posts were erected to convey vital information to the public about HIV/AIDS (Photo 7).

55. The contractor has established its Public Relations Department where 3 men-PROs were on duty. The PROs worked closely with the community to provide them with the information as appropriate and to work between community and the contractor. The PROs conducted community meetings to explain about construction progress as well as to keep the community informed about construction activities that may have an impact on the community by way of safety and health. The PROs were also deployed to inform community about the grievance redress mechanism as well as to collect such information for reporting. The contractor has complied with the request to appoint a woman-PRO in May who has been on duty during the latter part of the review period.

Photo 7 HIV/AIDS Sign Post along Road Alignment at Lampramp

2.10.3 Socio-economic issues of community

56. The local community members in general have received income from direct employment in construction works whilst few others have received income for the temporary use of their land by the contractor. They have also received income by way of selling food and other items to the contractor and the camp staff. Details of income received by APs is not available in this reporting but will be made available in the next reporting period. Proper record keeping is lacking therefore EA has instructed the contractor to keep proper monitoring and data records for future reporting.

57. The total number of community members employed by the contractor was 26 of which 2 are unskilled women. The local community members were employed for traffic control and cleaners. The contractor has been instructed to employ more women to make up the 30% women employees out of total workers as stipulated in the loan covenants. It is for this purpose that the contractor was instructed to employ a woman to be a PRO. This was the first contractor to employ a woman as PRO.

58. The contractor had prepared and implemented a traffic management plan. There were no major issues or accidents reported during the review period. Sign posts to the approach of the camp, quarry sites other risk sites were established by the contractor.

Photo 8 A woman employee at work

59. The contractor has purchased garden and livestock produce and locally available resources such as food crops, chicken, pigs and construction items (wooden poles, sand, etc.) from community members. Records on community cash benefit including amount in kina spent to purchase from the community is not available. The contractor did not keep the relevant records to extract data when required however there is evidence and reports of contractor purchasing food and local materials from the community's abundance. There is an arrangement in place now for the contractor to collect relevant data from APs for future reporting. The land owners are paid PNGK 4.50 per load of quarry material extracted whilst PNGK0.80 (80 Toea[1]) is paid for each cubic meter of gravel extracted from the river.

2.11 Existing Infrastructure

60. The contractor has caused structural damage to the Paiya Bridge by over-loading with machinery. The overweight has crushed the bridge and brought the general traffic to a standstill. The communities and users are affected by way of transport for two and half (2.5) months until the bridge was repaired and traffic was allowed to pass through in May 2016.

2.12 Community Consultations

61. Several community meetings and public consultations were planned and conducted by PROs. The purpose of these events was to inform public on construction plans, receive their feedback and to seek their assistance to resolve environmental impacts created by the project. However, the data on such events are not available for reporting.

[1] Toea - A unit of currency in Papua New Guinea equal to 1/100 of the kina.

2.13 Environment-related grievances

62. Three (3) grievances were submitted by community members along the road on the matter of damages caused to their property and assets. These have been assessed by GRC. The contractor has already undertaken to correct damages caused by its negligence.

63. The Grievance Redress Committee (GRC) inclusive of 6 members was established on 28th April 2016. The GRC conducted several meetings to resolve various environmental issues emerging during the construction works. All outstanding environmental issues (except for problems caused by natural landslides) have been resolved.

64. As part of grievance redress mechanism process and consultation, several awareness activities were done to inform and respond to APs during this period. Individual CRO delivered the awareness program and provide initial first hand response to APs with regards to their grievances. This activity focussed on those who have not yet submitted their grievances, the majority of whom were found to be vulnerable. The APs were informed about the process of handling environment-related grievances including the timeline to provide resolution to their grievances. It was encouraging that the people living along the Kotna – Lampramp road corridor have signed the MOU with the contractor whereby they have agreed that they will not demand the proponent for any compensation related to environmental damage.

3.0 Conclusions and Recommendations

3.1 Conclusions

65. The main conclusions arising from environmental monitoring activities during the review period are:

- The contractor has exercised many efforts to prepare subproject's CEMP despite several training provided by PIU in collaboration with ESSU. Several previous versions have been rejected as it was deficient in terms of not being site-specific and missed out parameters;
- The quarry operations have begun before the Quarry Management Plan (QMP) was cleared by ESSU. This has had several adverse impacts on the environment which has been mitigated by the contractor after EA doing monitoring of the project sites.
- The short-term environmental impacts created at the time of construction have been marginal and adequate mitigation measures have not been in place. There have been issues on river/stream water quality, air quality and noise in construction sites and complains and/or damages resulting from dumping of construction wastes. Sections where excessive soil erosion have taken place are being monitored and the contractor has been instructed to provide adequate control measures in future;
- The alignment in several sections had experienced landslides. These are expected due to the high mountains and steep terrains and high rainfall in the project area. The landslides have triggered soil erosions.
- This subproject does not have baseline data as required by the CEMP; and
- Lack of Personal Protective Equipment (PPE). Workers were not been issued with PPE during construction works and the reporting period.

66. Based on the above conclusions of internal monitoring, it is recommended that further actions are pursued as outlined in the next section.

3.2 Recommended Actions

67. The contractor has been instructed to implement corrective actions with regard to a number of parameters in the CEMP. The proposed actions, implementation timelines and other relevant information are provided in the Table below whilst the CAR is provided in Appendix 3.

Table 1 : Corrective Actions as per CEMP

Serial No.	Item and Corrective Action	Responsibility	Completion Date (Planned)
1	Preparation of Plans as follows: • solid wastes management • quarry management for 3 quarries • contingency and emergency response plan	Contractor to prepare, CSC to review/ feedback, HRMG to monitor and ESSU to approve	 July 20 August 15 July 31
2	Corrective actions as per approved CEMP on the following issues: Issue of PPE to workers and training conducted Streamline waste disposal Count of trees removed Baseline environmental data on water quality, noise level and air quality in 2 sites Data on benefits to community including employment of community members and materials purchased Data on public consultations Data on land slides	DOW/HRMG	 Sep 30 July 31 August 15 October 30 July 20 August 20 August 30
3	Environmental safeguards monitoring report (July-Dec 2016)	ESSU/HRMG	15th January 2017

Appendices

Appendix 1: List of References

1. Initial Environmental Examination for Kotna - Lampramp Road section (2013).
2. Construction Environment Management Plan for Kotna - Lampramp (January 2016)
3. Monthly Environmental Monitoring Reports (March, April, May 2016)
4. Quarry Management Plan (2016)
5. HIV/AIDS Control Plan (March 2016)

Appendix 2: List of People Interviewed

1. Ippio Acceri, Team leader, Construction Supervision Consultant
2. Kelly Kata, Project Engineer
3. Alphonse Niggins, Senior Field Coordinator, HRMG
4. Joseph Maiya, Environmental consultant, CSC
5. Paul Nombri, Manager, Technical Services, HRMG
6. Roselyn Isaak, Environmental Officer, HRMG
7. Rodney Kauru, Environmental Officer
8. Peter Patro, Public Relations Chief
9. Peter Pik, Chief Clan Leader
10. Noki Yalga, PRO
11. Francis Kumin, Health & Safety Officer
12. Terry Liang, Assistant Project Manager

Appendix 3 : Corrective Action Report by the Contractor

COVEC (CHINA) LTD

Kotna - Lampramp Road Project

CORRECTIVE ACTIONS FOR KOTNA LAMPRAMP ON NON-COMPLIANCE ACTIVITIES MONITORED AND REPORTED. BELOW ARE SOME OF THE CORRECTIVE ACTIONS THAT WILL BE ACTIONED AND THE TIMELINE FOR COMPLETION.

Serial No	Non-compliances issues or concerns	Corrective actions proposed by the contractor	Timeline for completion
1	**Erosion and Sedimentation** • High soil erosion from cut and fill/open areas between 11km to 15km has resulted in unusual high soil erosion • The sedimentation has set in lower areas including creeks at the bottom	To mitigate erosion and sedimentation on ridge slopes from 11km-15km, We have identified suitable locations to dump spoil from cuts on the slopes as per agreed by landowners and Engineer. • Revegetation will be done on the slopes by planting trees and grasses to contain soil or to keep soil intact to prevent further erosions in the future.	Dec 2016
2	**Water Quality** • Dumping of road waste in rivers has deteriorated water quality. The water quality was also found to be low in several other streams in the mountainous section due to excessive run off from landslides along the alignment • Extraction of materials from Angle and Muka rivers has deteriorated water quality • Baseline water quality data not recorded	• We will monitor this closely with dumping of construction waste into water ways and advise supervisors and drivers not to practise this habit. So far no road construction wastes were dumped into water ways as reported. • Due to malfunctioning of laboratory equipment at Lae Unitech, no water sample was collected and tested for baseline but however water quality tests will be done for any future river quarries as costs had been approved and will conduct jointly with the Engineer.	Dec 2016
3	**Contractor camp and yard** • Untreated sewerage (grey water) diverted into nearby creek that is feeding into Muka river. The communities are unhappy about the discharge of the camp waste into the river • Untidy camp surroundings with litter and waste materials. The sewerage water from the residential camp had been allowed to escape into the nearest stream untreated • Oil and lubricants leakage feeding into the creek	• Built 3x absorption centres to contain sewerage outlets and all well contained now • Employed a new casual to be a yard man who will clean the camp and surrounding areas to keep the yard neat and tidy. • Workshop area will be back-pilled with gravels as a form of bund to contain oil and lubricant leakage feeding into drain water	Oct 2016

4	**Noise** • There were reports from the community on the high noise level in the areas where construction works were in progress such as Angle quarry • Baseline data on noise level not recorded	Noise level is minimal and so far no complaints from surrounding communities. • Angle Crusher machine shifted to Muka River, Ch: 22+500. At this location, there are no houses and people living nearby • We will get advice from Engineer and do research to buy or order noise monitoring equipment from overseas as they don't sell the equipment in the country..	Dec 2016
5	**Waste Management** • The road wastes from construction works is rolled down slopes destroying natural vegetation and damaging streams further down. Overburden from quarry site chainage 15+00 is dumped along the road and down the slope	• Suitable locations have been identified to dump spoil from cuts on the mountain as per agreed and signed by the landowners and Engineer. • Revegetation will be done on the slope at ch:15+000 by planting trees and grasses to contain or to keep soil intact to prevent further erosion. • We will also advise quarry supervisor at ch:15+00 to advise operators not to push materials down the slopes.	Dec 2016
6	**Trees removal and vegetation management** • A number of trees were removed from the Right of Way to pave the way for road construction. Other trees were damaged due to negligence of machine operators and dumping of road wastes. The number of trees removed is unknown	• All trees removed from the right of way have been counted and recorded and included in monthly reports. • We will count and report if any other trees were removed and not included in the report starting as of this month.	Dec 2016
7	**Socio economic issues of the community** • The contractor has been instructed to employ more women workers. The proportion of women workers is currently at about 10%	• We are now engaging more women as temporary workers to work on the earth works to collect and wash stones to build earth walls. • Employed women to display stop and go signs plus women working in the camp as kitchen hands and cleaners.	Oct 2016
8	**Air quality** • Baseline data has not been recorded	• We will get advice from Engineer and do research to buy or order air measuring equipment from overseas as they do not supply or sell this equipment in the country.	Dec 2016