

Semi-annual Report

March 2017

Highlands Region Road Improvement Investment Program – Tranche 2.

Kotna – Lampram Road Sub-project.

Prepared by Department of Works for the Asian Development Bank.

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HIGHLAND REGION ROAD IMPROVEMENT INVESTMENT PROGRAM – TRANCHE 2

Kotna to Lampramp ROAD SUB-PROJECT ENVIRONMENTAL SAFEGUARDS MONITORING REPORT

(July to December, 2016)

Project Implementation Unit

Department of Works

National Capital District

Papua New Guinea

March 2017

Table of Contents

Abbreviations	5
1.0 Introduction	6
1.1 Background	6
1.2 Project Description	6
1.3 Purpose	7
1.4 Methodology	8
1.5 Report Organisation	8
2.0 Monitoring Results and Findings	8
2.1 Contractor's camp and yard	9
2.2 Erosion and sedimentation control	9
2.3 Water quality	10
2.4 Air quality	11
2.5 Noise	11
2.6 Waste Management	12
2.7 Hazardous materials management	13
2.8 Aggregate extraction	13
2.9 Trees removal and vegetation management	14
2.10 Socio-economic issues (workers)	14
2.10.1 Workers health and safety	14
2.10.2 HIV/AIDS and STDs	14
2.10.3 Socio-economic issues of community	15
2.11 Existing Infrastructure	16
2.12 Consultations	16
2.13 Environment-related grievances	16
3. Conclusions and Recommendations	17
3.1 Conclusions	17
3.2 Recommended Actions	17
Appendices	19
Appendix 1: List of References	19
Appendix 2: List of People Interviewed	19
Appendix 3 : Status of Corrective Action Request	19

Figures

Figure 1: Poor Construction Practices near Km11.....	10
Figure 2 : Sedimentation around Km10.....	10
Figure 3 : High-turbidity in Muka River result from material extraction.....	11
Figure 4 : Accumulated waste in a stream near camp site.	12
Figure 5 : Muka River bank erosion triggered by gravel extraction	13
Figure 6 : Women employees on site	15

Tables

Table 1 : Staffing and reporting role of execution of CEMP	17
Table 2 : Corrective Actions as per CEMP	18

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
FPM	-	Field Project Manager
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
HRRIP	-	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
QMP	-	Quarry Management Plan
ROW	-	Right of Way
RP	-	Resettlement Plan
SHP	-	Southern Highland Province
SIS	-	Socio-economic Impact Study
SPS	-	Safeguard Policy Statement
STDs	-	Sexual 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 to 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 projects include improvements to three road sections namely, Mendi-Tambul (55.53km), Kotna-Lampramp (31.65km) and Ialibu-Kagua (32km) in the Southern Highlands/Western Highlands, Western Highlands and Southern 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 permitted 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 Angalimb 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 exchange 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.

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 camp at the village named Tigi in Western Highlands.

14. Internal monitoring was undertaken by the environmental specialist of the Construction Supervision Consultant (CSC) and Environmental Officer (EO) for HRMG, overseen by PIU's safeguards specialist in collaboration with ESSU Environmental Officer. Monthly monitoring reports have been prepared by the contractor for verification by the CSC.

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 their mitigation measures for the period July to December 2016.

1.4 Methodology

18. The six-monthly report is written using data gathered from several sources such as:

- a. Contractor's reports;
- b. Supervision Consultant's reports;
- c. Camp log-book;
- d. HRMG and PIU audits.

In addition, primary data has been gathered from discussions with project staff including contractor staff, government officials and meetings with the community.

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 in this road section include:

- 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
- vii. Awareness and education of contractor staff and community on HIV/AIDS minimization and
- viii. 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:

- Contractor's camp and yard

- Erosion and sedimentation
- Water quality
- Air quality
- Noise
- Waste management
- Hazardous material management
- Aggregates extraction
- Tree removal and vegetation management
- Socio-economic issues (workers)
- Socio-economic issues (community)
- Public safety
- Health and safety issues
- Traffic management
- Prevention of HIV/AIDS and STDs
- Existing infrastructure issues

24. In addition to above parameters, information on the following activities are included in the SMR.

- Information on public consultations by the contractor;
- Management of environment-related grievances;
- Benefits to the community; and
- Institutional arrangements.

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

2.1 Contractor's camp and yard

26. The newly built camp at Tigi at 17+900 kilometres from Kotna operated during the review period. The rent for the land lease has been paid already to land owners. This camp is fully equipped with workers' accommodation, kitchen facilities, toilets, workshop, office complex and store rooms. It is also 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.

2.2 Erosion and sedimentation control

27. Soil erosion and sedimentation was generated during the review period in sections where clearing and grubbing as well as cut and fill occurred. It was high especially in the section that traverses over the hilly landscape that generated substantial amount of cut and fill. Although the contractor has adopted various methods such as drains, gabion baskets, cutting benches to slow down erosion and providing line drains, the occurrence was high that escaped large volume of soil into the vegetation and subsequently into water ways. Examples are at chainage 11+900, 12+600, 12+800, 13+400, 13+800 and 15+200. In areas with moderate slopes, the control measures were adequate to minimise soil erosion.



Figure 1: Poor Construction Practices near Km11

28. Sedimentation has occurred in streams, agricultural lands and on other pathways even though 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 natural forest area but the scale of loss was so high that did not bring about effective sedimentation control.

29. The contractor has been issued with Corrective Action Request (CAR) on 5th August 2016 in respect of soil erosion and sedimentation control. Details are presented in Appendix 3.



Figure 2 : Sedimentation around Km10

2.3 Water quality

30. 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 Muka River where a river-based quarry is in operation (Photo 2). However, the impact of lowered water quality is temporary as it returned to normal after extraction is suspended.

31. The baseline water quality measurement has not been conducted due to the absence of equipment. However, water quality monitoring will be conducted visually.



Figure 3 : High-turbidity in Muka River result from material extraction

32. The un-treated sewage water from the residential camp had been allowed to escape into the nearby stream finally discharging into the Muka River. There have been several complaints from the community on this issue. A case filed by the community on the same issue was heard by the village court that issued notice to the contractor to fix it as soon as possible. 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 began, according to visual observations. The contractor has been instructed to prepare the CAR in respect of improving water quality.

33. 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

34. 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

35. There were no reports from the community on high noise levels during the review period. In a few instances, at the request of the community, construction works were re-scheduled for day-time. The noise level continues to be monitored by observation until the equipment arrives at the site.

2.6 Waste Management

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

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

37. The over burden generated from road sides was dumped in 17 designated sites where and owner agreements have already been made. However, there is evidence that the contractor has dumped waste material elsewhere damaging the environment. The contractor has been served with CAR on 5th August 2016 to fix the environment damage caused. Appendix 3 has details.

38. 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 1). This is non-compliance where CAR has been issued to the contractor (See Appendix 3).

39. The contractor has resolved road waste dumped on coffee gardens near 17 km. This issue has been reported in the previous report.

40. On reporting of such impacts, 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.

41. Apart from the improper dumping of spoil referred to above, 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.

42. Although much of the camp waste generated in the kitchen has been dumped in a pit near 18 km, site inspections revealed littering around camp (Photo 4). The contractor has been advised to clean rubbish and dump it only in the pit. The contractor continued to provide compensation by way of an agreed fee to the land owner for the temporary use of land for rubbish disposal.



Figure 4 : Accumulated waste in a stream near camp site.

2.7 Hazardous materials management

43. The hazardous wastes which will be generated from construction works are the bitumen, paints and lubricants. It is expected that all such materials are contained in the contractor's yard with controlled entry to people and disposed properly. 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. Leakage of fuel and lubricants from the camp have been reported where there is evidence that such material is not handled properly. It was noted that the contractor has burnt inside the camp waste oil, lubricants, hazardous material and other parts removed from vehicles. This is a non-compliance activity where the contractor has been issued CAR on 5th August 2016 on this matter.

2.8 Aggregate extraction

44. The contractor operated four quarries, three river based located along the Angel River, Muka River 2 sites and Epa the latter a land-based quarry. The previous quarry at Puiya River has been closed down due to the short-supply of material of required quality. The closure of operations is unsatisfactory where depressions remain to be levelled off, waste not managed and trees not planted. 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 gravel extraction in Muka River has triggered bank erosion which the contractor has been notified to fix. The material extracted is transferred to stockpile area where crushing and batching take place. The quarry management plan for all 4 quarry sites has already been approved and the monitoring has been undertaken during the review period.



Figure 5 : Muka River bank erosion triggered by gravel extraction

45. The environmental impact from the 3 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 plan to rectify the damage (Appendix 3).

2.9 Trees removal and vegetation management

46. Several trees have been removed from quarry sites. The contractor has been instructed to replace the loss trees by planting tree seedlings. This will be done after the completion of construction works in the affected areas. The contractor will provide seedlings to people along the alignment for planting in order to replace what is being destroyed.

2.10 Socio-economic issues (workers)

47. 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 aspects with the CEMP is discussed below.

2.10.1 Workers health and safety

48. 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.

49. 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 has been issued with personal protective equipment (PPE) and the necessary training provided. However, the workers have not complied with the requirement to wear PPE when on site. Further discussion will be held with the contractor to resolve this issue. In the meantime, this will be continuously monitored. A CAR has been issued to the contractor on 5th August to correct this non-compliance action. Appendix 3 has details.

50. 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

51. The contractor continued to implement the HIV/AIDS Plan. 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, as reported in the previous report, two sign posts have been erected to convey vital information to the public about HIV/AIDS.

52. The contractor has established its Public Relations Department where 1 PRO and 3 men-CROs were on duty. One woman-CRO recruited at the instruction during the previous reporting period. 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.

2.10.3 Socio-economic issues of community

53. Several members of the community in general have received income from 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. The camp pays about Kina 800 per week to community members for the purchase of food and garden produce. Further details of income received by APs are being prepared by the contractor for reporting.

54. The number of women community members employed by the contractor has grown after the recruitment of the woman CRO. The women community members have been employed as traffic assistants, cleaners and construction support workers. 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 CRO.

55. The contractor has assisted the community by way of free issue of sports materials and tree planting to commemorate World Environment Day where 150 seedlings were planted.

56. 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. Women workers have been employed both as traffic assistants and in construction works.



Figure 6 : Women employees on site

57. The land owners are paid Kina 4.50 per load as royalty for quarry material extracted whilst Kina 0.80 is paid for each cubic meter of gravel extracted from the river.

2.11 Existing Infrastructure

58. The main issue on infrastructure is that the bridge at Buiyer River washed away sometime in December. This has affected the movement of people, their produce to market and the delivery of construction material to Lampramp (towards road end).

2.12 Consultations

59. Several community meetings and public consultations were planned and conducted by PRO and CRO team. 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. The data on such events are being compiled for reporting in the next SMR.

2.13 Environment-related grievances

60. The previous grievances on damage to coffee plantations have been fully resolved by paying compensation to affected community members. The only grievance during the current reporting period is the sewage leak from the camp. The contractor has been instructed to fix this problem by an order of the village court.

61. The Grievance Redress Committee (GRC) inclusive of 6 members was established on 28th April 2016. The GRC has been working to resolve various environmental issues emerged during construction works. All outstanding environmental issues (except for the sewage leak) have been resolved.

62. An incident has occurred between kilometres 1 to 8 where the community has demanded compensation for the removal of trees within ROW. As a result, the work had to be stopped for a few days until the matter was resolved where the GRC members and project staff explained to the affected community on the matter of MOA. They have been educated on the provisions of MPA that confirmed support to community assets building in lieu of individual compensation. As part of grievance redress process, awareness raising among APs has been undertaken during the review period. One CRO was working on both awareness creation and to provide initial response to APs with regard 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 also explained about the process of handling environment-related grievances including the timeline to provide resolution to their grievances.

3.0 Institutional Arrangements

63. The institution responsible for the implementation of CEMP consists of (i) contractor, (ii) construction Supervision Consultant, (iii) HRMG assisted by PIU in collaboration with ESSU. The contractor is responsible for the execution of the environmental management of the project as specified in the CEMP. The role of CSC is to ensure that contractor manage the environment, conduct site monitoring and to approve the invoice for payment. The CSC also provides instructions to the contractor with regard to overall management of the environment and provides advice to the team. The role of HRMG is to resolve land owner issues, provide facilitation of the construction program, conduct audit and issue CAR notices to the contractor.

64. Table 1 below presents staffing and monitoring arrangements for the implementation of CEMP for this Kotna-Lampram Road sub-project.

Table 1 : Staffing¹ and reporting role of execution of CEMP

Institution	Staffing (number)			Reporting
	Management	Environment	Field	
Contractor	2	Environment officer 1; H&SO 1	5 PROs	Following reports on a monthly basis: <ul style="list-style-type: none"> • Construction progress • HIV/STD plan • Environment management
Construction Supervision	1	2 ^a	None	<ul style="list-style-type: none"> • Monthly environment monitoring report
HRMG/PIU	3	1 ^b	1 CRO	Quarterly report to EA
ESSU	1	2 ^c	None	Review and submission of SMR to DOW/ADB

3. Conclusions and Recommendations

3.1 Conclusions

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

- The quarry management plan has not been adequately adhered to by the contractor. There is evidence of damage to environment including the pollution of river water triggered by construction activities that have not been managed satisfactorily. There have been issues on lowered river/stream water quality the impact of which confined to few days;
- The closure of Puiya quarry is unsatisfactory where excavated areas have not been levelled off and the trees removed have not been replaced;
- Sewer leak from the camp has caused stream pollution where community agitation has been high. Littering around the camp was observed. The contractor has been instructed to fix the problems;
- The short-term environmental impacts created at the time of construction have been marginal and mitigation measures have been effective;
- Sections where excessive soil erosion and sedimentation have taken place are being monitored and the contractor has been instructed to provide adequate control measures in future;
- PPE to workers had not been issued during the reporting period; and
- The contractor has been issued with CAR to fix all CEMP non-compliance issues. The list is closely monitored by both CSC and HRMG.

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 summary table below presents proposed actions, implementation timelines and other relevant information together with the status of corrective actions in the previous report whilst the details are provided in Appendix 3.

¹ One national consultant on full-time basis and 1 international on intermittent basis. Shared by all HRRIP T-2 projects has an environmental officer and an international environmental specialist, latter on intermittent basis. IES is for all 3 tranches, One senior environment officer and one environment officer responsible for all ADB projects

Table 2 : Corrective Actions as per CEMP

Serial No.	Item and Corrective Action	Responsibility	Completion Date (Planned)
1	Preparation of Plans as follows: <ul style="list-style-type: none"> • 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 deadline not met August 15 (completed) July 31 deadline not met
2	Corrective actions as per approved CEMP on the following issues: Issue of PPE to workers and training conducted Streamline waste disposal and burning of haze waste 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	Contractor	Training conducted but PPE still pending July 31 deadline not met; new concerns during reporting period August 15 deadline not met October 30 (not done)
3	Environmental safeguards monitoring report (July-Dec 2016)	PIU/ESSU	15 th January 2017 (revised date 31 January)
4	Unsatisfactory closure of Piuya quarry	Contractor	31 March 2017
5	Untreated sewer discharged into the river	Contractor	31 January 2017
6	Environmental rehabilitation around chainage 9 to 11	Contractor	31 March 2017 (tree planting at a later date)

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 (July, August, September, October 2016)
4. Quarry Management Plans for Apa, Kakat, Angel and Muka (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 : Status of Corrective Action Request

Serial No.	Description of Non-compliance Issue	Action and date	Remarks
1	Sewer discharge at Tigi Camp. Grey water is diverted to natural streams without any treatment	Village Court action issued to contractor	
2	Solid waste dumped near Tigi Camp causes nuisance to adjacent community. Bio-degradable and non-degradable material not separated	CAR issued on 5 th August 2016	Item will be monitored
3	PPE materials inadequately supplied to local workers. Workers not using it at work	Contractor notified on this issue	
4	Burning of waste oil, fuel and vehicle parts inside camp	CAR issued on 5 th August 2016	
5	Road waste material not disposed properly. Damage to natural forest between 10 km and 15 km	Notice of violation issued to contractor on 5 th August 2016	Will be monitored in first quarter 2017
6	Extraction of materials in Muka and Angel River turned stream water murky		
7	Preparation of QMP for Muka Quarry	Notified on 17 th June 2016	