

Semi-Annual

July 2018

**PNG: HIGHLANDS REGION ROAD IMPROVEMENT
INVESTMENT PROGRAM (TRANCHE 3)
Nipa-Munihu Road Sub-Project**

Prepared by of the Department of Works for the Asian Development Bank

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Report: Semi-Annual

HIGHLAND REGION ROAD IMPROVEMENT INVESTMENT PROGRAM – PROJECT 3

Nipa-Munihu Sub-Road Project

ENVIRONMENTAL SAFEGUARDS MONITORING REPORT (January - June 2018)

**Project Implementation Unit
Department of Works
National Capital District
Papua New Guinea**

August 2018

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ABBREVIATIONS

ADB	-	Asian Development Bank
AIDS	-	Acquired Immune Deficiency Syndrome
AP	-	Affected People
CEMP	-	Construction Environment Management Plan
CRO	-	Community Relations Officer
PSC	-	Project 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	-	Highlands Region Core Road Network
HIV	-	Human Immunodeficiency Virus
HRMG	-	Highlands Road Management Group
HRRIIP	-	Highlands 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
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
STDs	-	Sexual Transmitted Diseases
TOR	-	Terms of Reference

FACT SHEET:

Loan	ADB Loan: 3404/3408 and Grant 0485 PNG
Project Number	CSTB 3531
Subproject	Nipa-Munihu Road Subproject
Executing Agency	The Department of Works (DOW) is the executing agency for the Highlands Region Road Improvement Investment Program (HRRIP). It has overall responsibility to manage the planning, implementation and monitoring for all road improvement works including environmental management and environmental compliance monitoring. It also includes the acquisition of use rights for additional land to implement HRRIP subprojects, as well as compensation for damages on project-affected land DOW is also responsible for reporting to ADB and the recruitment of the organization to conduct independent monitoring
Implementing Agency/Unit	<p>The DOW will also be the Implementing Agency for the road improvement works. The DOW has delegated to the Highlands Road Management Group (HRMG), the responsibility to carry out the planning, implementation and monitoring for environmental management and environmental compliance monitoring, land acquisition and/or resettlement activities, as required. The more relevant delegated responsibilities include the following;</p> <p>Prior to the commencement of civil works:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Submit and indorse environmental assessments required for regulatory approval of the CEPA and require the Contractor to obtain approval, e.g., environmental clearance, environmental permit or permits from other statutory authorities as required by the Government. <input type="checkbox"/> Ensure that all regulatory clearances for the subproject are obtained from the relevant government authorities and are submitted promptly to ADB. <input type="checkbox"/> Ensure that the EMP is updated based on detailed design and included in the bidding document of the subproject and that all bidding Contractors have access to the environmental assessments and EMP. <input type="checkbox"/> Ensure that the EMP and all required mitigation measures during construction, including conditions stipulated in the CEPA's clearance or environmental permit, are included in BCD with requirements to update the EMP in response to any unexpected impacts and <input type="checkbox"/> That all selected Contractors have agreed to implement in full the requirements of environmental mitigation measures prescribed in the EMP <input type="checkbox"/> Provide training as required to HRMG in Mt Hagen and Contractor; <input type="checkbox"/> Receive environmental safeguard clearance on subproject(s). <input type="checkbox"/> Provide training to Contractor prior to preparation of

	<p>CEMP, safeguards requirements of ADB and regulatory requirements of CEPA.</p> <p><input type="checkbox"/> Approve CEMP for the subproject, after being cleared by PSC.</p> <p>During the implementation of civil works:</p> <p><input type="checkbox"/> Ensure that the CEMP including all proposed mitigation measures and monitoring and relevant provisions of the environmental assessments is updated as required,</p> <p><input type="checkbox"/> Conduct environmental management and compliance monitoring on a monthly basis in cooperation with the PSC.</p> <p><input type="checkbox"/> Review and assess the Contractor's monthly environmental monitoring report and compliances as contained in the CEMP.</p> <p><input type="checkbox"/> Assist the Engineer in the compliance of the submitted CEMP.</p> <p><input type="checkbox"/> Prepare the quarterly and semi-annual reports in cooperation with the PSC for submission to DOW and ADB.</p>
Coverage of the Semi-Annual Environmental Monitoring Report	January to June 2018

EXECUTIVE SUMMARY

- I. This semi-annual environmental monitoring report covered the period from January to June 2018. This report was prepared and submitted by the DOW through the Highlands Road Management Group (HRMG).
- II. The Nipa-Munihi road sub-project is one of the 4 sub-projects of Tranche 3 of the Highlands Region Roads Improvement Investment Program, an ADB assisted road program. The sub-project is covered by CSTB contract # 3531 entered into by the Independent State of Papua New Guinea represented by the Department of Works and China Overseas Engineering Company LTD (COVEC China).
- III. The project has commenced in December 11, 2017 with the mobilization of the Contractor. The construction period of the project is 24 months. The Long Term Performance Based Maintenance Services is 60 months from the issuance of the Performance Certificate for the Improvement Work.
- IV. The CEMP, Occupational Health and Safety, and Traffic Management Plans were submitted and approved by DOW-ESSU. However, the Quarry Management Plan, HIV/AIDS & STD Plans, Hazardous Waste Management, Sewerage Waste Management, and Solid Waste Management Plans were submitted but not approved by DOW-ESSU.
- V. The impact of the earthquake has delayed the project due to the landslides that have happened along the road corridor.
- VI. The PSC and HRMG has provided close monitoring on environmental issues including unwarranted disposition of spoils, better leaking sewages, employment of women and worker's privileges and rights were raised with the contractors.
- VII. There is a need to conduct monthly monitoring using in-situ equipment for the identified environment parameters. However, the contractor has to purchase the required equipment.
- VIII. There is a need to revise and submit the Quarry Management Plan, HIV/AIDS & STD Plans, Hazardous Waste Management, Sewerage Waste Management, and Solid Waste Management Plans which were not approved by DOW-ESSU.
- IX. The implementation of the CEMP and the associated plans should be done, and a checklist of the monthly monitoring requirements need to be revised to accommodate the revisions made on these plans.
- X. The application of Notices of Violation should be an option that needs PSC and HRMG vigilance to implement best practices in environmental management.
- XI. The review by PSC and HRMG of the Quarry Management Plans should be prioritized considering the environmental impact of these activities. The use of maps to ensure that environmental best practices in soil erosion and sedimentation management are recommended.

1.0 INTRODUCTION

1.1 Background

1. The Highlands Region of Papua New Guinea (PNG), comprising the Provinces of Western Highlands, Jiwaka, Southern Highlands, Hela, Eastern Highlands, Enga and Chimbu, is a major contributor to the PNG economy through its 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 investments in improving the road network but a lack of maintenance has resulted in the deterioration of the roads such 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 (iii) 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 (HRRIP) in tranches. The HRRIP 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.
4. Project 1 has included the improvement of two road sections and Project 2 is currently being implemented to upgrade three road sections while Project 3 is rehabilitating four road sections comprising 113.3 km of the HCRN.
5. The Execution Agency (EA) for the program is the Department of Works (DOW) whilst the Highlands Region Management Group (HRMG) is the Implementation Agency (IA).
6. Tranche 3 (ADB 3043/3408 and EU Grant 0485) include the upgrading, rehabilitation and maintenance of four road sections namely, Henganofi-Napuru, Gewa-Gembogl, Pangia-Wiru Loop, and Nipa-Munihi in the Eastern Highlands Province (EHP), Chimbu Province and Southern Highlands Province (SHP).
7. The rehabilitation of the Nipa to Munihi road in the Southern Highlands province has a length of 28.55 km. The works proposed for the upgrading and rehabilitation of the Nipa to Munihi Road such as earthworks, establishment and operation of quarry sites and extraction of materials, minor civil works and discharge of wastewater are Level 2 activities under the EPAR and requires an EP depending on the duration and scale of those activities.
8. The CEMP was approved in February 5, 2018 and the project commencement date was February 23, 2018 with the mobilization of the Contractor. The construction period of the project is 24 months. The Long Term Performance Based Maintenance Services is 60 months from the issuance of the Performance Certificate for the Improvement Work.
9. The Nipa-Munihi Road Section is covered by CSTB contract # 3531 entered into by the Independent State of Papua New Guinea represented by the Department of Works and China Overseas Engineering Group Co. Ltd (COVEC LTD).

1.2 Sub-Project Description

10. The Nipa to Munihi road, located in the Southern Highlands Province, commences at the junction with the Highlands Highway in Nipa and extends to Peane junction on the Mendi–Kandep road, a distance of 27.73 km. The road connects the two electorates of Nipa-Kutubu and Mendi-Munihi with the border located at an existing log bridge at km 18+850. The road traverses hilly terrain from the commencement at Nipa to around Km 4 and again from Komal Bridge at Km 17+350 to the end of the road at Peane. The central portion of the road runs through mountainous terrain as the route crosses the Tondon Range. Within this central portion of the road the elevation rises to a maximum of 2,300 meters from the average mean sea level (amsl) to 1,950 meters at the end of the hilly sections.
11. The existing road comprises mainly of a silty clay subgrade covered with a gravel layer consisting of poorly graded limestone material which results in a rough running surface. There are also several sections where the subgrade has been exposed with no gravel layer. The road width varies from 3m to 4m in the mountainous section and 6 to 8 m in the hilly sections. Where widening of the road bench is necessary, the design is based on cutting existing slopes rather than widening embankments.
12. When completed, the improved road will facilitate the delivery of services to the population and stimulate economic growth through the reduction in travel times and costs of transporting goods to markets. The impacts of the improvements in what is already a highly disturbed environment will be minimal. Improvements will generally be restricted to a maximum 3 metre wide strip each side of the existing formation and implementation of the EMP will minimize the environmental impacts during construction. Restoration of quarry and dump sites upon completion and the planting of trees are an integral part of the works. (See Figure 1: Location Map of Nipa Munihi Road.)



Figure 1: Location Map of Nipa Munihi Road

13. The route crosses two rivers, the Nembi and the Lai River, both on Bailey bridges which are in good condition. There are 8 creeks crossing the alignment, all of which

have log/timber bridges which will need to be replaced with Bailey bridges with steel deck. All of the creeks have well defined incised channels which are sufficient to contain flood flows

14. The environmental impacts assessed at the time of preliminary design categorized the subproject as Category B for environment. The same category was confirmed by the in- depth environmental analysis conducted at the time of project preparation. The Initial Environment Examination (IEE) dated April 2016 has already been disclosed in the ADB web site. The IEE confirmed that environmental impacts of the rehabilitation of the Nipa-Munihu subproject road are limited to the road corridor, are of minor scale and 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.
15. Based on the EMP presented in the IEE, a Construction Environmental Management Plan (CEMP) was prepared and approved by DOW-ESSB on February 5, 2018.
16. An Induction Meeting was conducted for all the Contractors in July 12, 2017 by the Project Supervision Consultants, HRMG and The Engineer to provide a background of the environmental management plans and compliance monitoring requirements.
17. Electronic reference materials were provided to the Contractors during this meeting containing best practices for environmental management and mitigation, including sewage treatment, solid and hazardous waste management; and soil erosion control and management. Based on the experiences with Tranche 1 and Tranche 2, environmental laws including a summary presentation on the legal framework of PNG, CEPA Act, Environment Act of 2000, list of suggested environmental monitoring equipment, and PNG Water Quality Standards, was also provided. Other important forms and documents were also provided such as sample forms and requirements for monthly monitoring report, Notice of Violation Form, and Logbook Sample Content.
18. An Induction Training was also conducted on October 31 to November 1, 2017 by PSC and HRMG to address Construction Environmental Management Plans formulation, Environmental Management, Environmental Monitoring and Best Practices for Environmental Mitigation at Kuri Lodge, Mt. Hagen. The training was attended by the contractor's representative and environmental officers, HRMG, PSC and NRA.
19. Internal monitoring will be conducted by the environmental specialist of the Construction Supervision Consultant (PSC) whereas independent monitoring will be conducted by the Environmental Officer (EO) of HRMG. However, the monthly environment reports submitted to DOW are joint PSC and HRMG reports.

1.3 Proposed Scope of Works

20. The project intends to improve the existing Nipa to Munihu Road through the provision of a 5.5 meter wide pavement, sealed with DBST and 0.25 meter gravel shoulders which will be sealed where necessary to prevent erosion. Earthworks will be required to provide an adequate bench for construction of the pavement and associated drainage and will also be required where improvements are required in the vertical alignment to ensure adequate stopping sight distance. An average additional width of 2.5 m on each side of the existing cleared width will be required to accommodate the improvement works. The estimated volume of excavation is 196,000 m³ of which

86,000 m³ will be reused for embankments and the remainder is expected to be partly surplus and partly unsuitable and therefore to be disposed of. Approximately 40,000 m³ of borrow will be required for the balance of embankment construction.

21. Approximately 850 linear meters of retaining wall will be required at various locations throughout the road length to provide adequate formation width and avoid extensive embankment construction. The improvements will include the provision of road safety features including signs, pavement markings and guardrails.
22. A total of 55 additional culverts are proposed in addition to the replacement of 56 existing culverts which are of inadequate capacity (typically 450mm diameter) while 65 existing culverts are redundant and will be removed. Approximately 28,000 meters of lined roadside drain will be provided to cater for surface water runoff from the road and adjacent slopes. The rehabilitation and upgrading would take approximately 24 months.
23. The rehabilitation and upgrading would involve the following activities:
 - (i) Transport, handling and storage of construction materials, fuel and lubricants and, machinery to site;
 - (ii) Preparation of Contractor's camp and work sites;
 - (iii) Establishment of ancillary facilities i.e. identification and establishment of suitable material sources/quarries, batching, crushing and asphalt plants;
 - (iv) Clearing and grubbing (shoulders and drainage);
 - (v) Excavate defective sections and improve side drains as required;
 - (vi) Excavation and/or filling to widen the existing road bench;
 - (vii) Culvert removal, installation, extension and/ or replacement;
 - (viii) Construct masonry retaining walls;
 - (ix) Construction of gabion protection works;
 - (x) Rehabilitate bridges which may include installation of new steel decks if necessary, removing rust and repainting and, construct a new bridge;
 - (xi) Backfill and compact as required;
 - (xii) Layout sub-base and base materials and compaction;
 - (xiii) Install road furniture required (guardrails, pavement markings, etc.); and
 - (xiv) Pave roadway with DBST.
24. The upgrading and rehabilitation works for the Nipa to Munihi Road would require approximately 231 people of which 120 unskilled workers will be sourced from the local communities in the area. Various machinery and heavy equipment will be required in the rehabilitation and upgrading works. This would range from 4WD vehicles to

bulldozers and represents the manpower complement and machinery and equipment required for the works.

25. The works require materials including fuel, lubricants, paint, bitumen, cement, aggregates, cement, sand, timber, geotextile, drainage pipes and culverts. All materials will be sourced from approved suppliers. Workers, including local women, will make gabions using local materials for embankment and bridge pier protection:

1.4 Purpose

26. This report is written to present the status of the environment including compliance with the approved CEMP in respect of the Nipa - Munihu road section covering January to June 2018. Semi-Annual environment safeguards monitoring reports is a requirement under the SPS. In addition, the report provides a clear picture with regard to the future implementation of CEMP activities as well as the environmental outcome.
27. Since the project has just commenced, the compliance monitoring requirements enumerated in the monitoring findings are prospective and will be evaluated with the approved CEMP.
28. Furthermore, the report serves the client, ADB, other organisations and the public to understand the environmental management process, its outcome, the corrective actions that are required and the impact of such actions on the environment.

1.5 Methodology

29. This three-month consolidated report is written using data gathered from several sources. These include (i) Contractor's interviews and monthly reports; (ii) Monthly monitoring report of the Project Supervision Consultant's Environment Specialist and (iii). Monthly HRMG-PIU verification of site and observations.
30. This report is reviewed and prepared by the Project Supervision Consultant and HRMG-PIU prior to its submission to DOW. It also follows the format prescribed by ADB and a checklist for monitoring environmental compliance.
31. The list of reports reviewed is in Appendix 1 whilst names of people interviewed are in Appendix 2.

1.6 Institutional Arrangements

32. The Department of Works, as the executing agency, has the overall responsibility to manage the planning, implementation and monitoring related to acquiring use rights for additional land to implement HRRIP subprojects, as well as compensation for damages on project-affected land.
33. DOW established a Project Management Office (PMO) headed by a Project Director which manages the day to day activities of the program. Within the PMO, there are two units, the Project Management Unit (PMU) which is based in Port Moresby. The other is the Highlands Road Management Group (HRMG), the DOW's Project Implementation Unit (PIU) for HRRIP subprojects to carry out the planning, implementation, monitoring and reports preparation for land activities, as required and is based in Mt. Hagen City.
34. In the revitalized organizational chart (as of February 2017), the HRMG is headed by the Field Project Manager (FPM). Under the FPM are two sub-units, the construction

unit headed by the “Engineer” and the social and environmental safeguards unit headed by the Senior Field Project Coordinator (SFPC).

1.7 Report Organization

35. The report consists of the foregoing introduction and 2 other sections as follows:

- i) Section 1 – Executive Summary
- ii) Section 2 - Introduction,
- iii) Section 3 – Monitoring results and finding
- iv) Section 4 – Conclusions and recommendations and appendices

2.0 MONITORING RESULTS AND FINDINGS

36. The main findings of monitoring shall include the assessment of environmental impacts during the review period and prescriptive requirements are presented in this section.

37. The basis for monitoring are the parameters that would be considered in the CEMP of which there are 18 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
- Environment Related Grievances
- Training and Mentoring

38. The summary of non-compliance from the monthly reports prepared jointly by HRMG and PSC is provided in Table 1. Environment Officers from HRMG with PSC should prepare the Notices of Violation if warranted based on the standards set during a meeting for this purpose.

Table 1: Summary of Non-Compliance for January to June 2018 for Nipa - Munihi.

NON-COMPLIANCE	MONTHS					
	J	F	M	A	M	J
Conduct monthly environmental monitoring and compare it with previously conducted environmental baselines.	-	X	X	X	X	X
Wastes from clearing and grubbing are dumped into environmentally rivers and streams.	-	-	-	-	X	X
Absence of soil erosion and sedimentation mitigation measures.	-	-	-	X	X	X
Absence of environmental in-situ equipment to conduct field measurements.	-	-	X	X	X	X
Absence of appropriate PPEs for workers.	-	X	X	X	X	X
Absence of camp clinic with nurse or appropriate health personnel to provide first aid.	X	X	X	X	X	X
Absence of traffic personnel and warning signages in the road project.	-	X	X	X	X	X
Absence of HIV-AIDS Service Provider to provide services as identified in the HIV-AIDS Plan.	-	X	X	X	X	X
Revise and get approval of the Quarry Management Plan, HIV/AIDS & STD Plans, Hazardous Waste Management, Sewerage Waste Management, and Solid Waste Management Plans.	-	-	X	X	X	X

2.1 Contractor's Camp and Yard

39. The Contractor has completed and occupied its camp at Mt. Wiru. The Engineer's quarters and offices have also been completed (Photograph 1). The Site Development Plan and the sewage treatment facility design need to be provided.
40. The contractor has also provided leisure facilities including a basketball court, tennis court, vegetable garden and duck pond. It is hoped that these facilities would provide health benefits while the last two could be used for the solid waste management strategies including fertilizer production from composting.
41. The use of an old garbage dump at the back of the camp has to be monitored in terms of the trash that are deposited following segregation procedures.
42. An old septic tank is leaking sewage into a nearby drain. This must be investigated to ensure that it would not pollute adjacent water bodies (Photograph 2).



Photograph 1: The contractor's camp at Mt. Wiri.



Photograph 2: Old sewage pond that needs to be investigated.

2.2 Erosion and Sedimentation Control

43. The massive earthquake of February 26, 2018 has damaged existing infrastructure and has also curtailed movement and communications in the project site (Photograph 3).
44. The contractor done clearing and grubbing activities including excavation works at the Munihu side at Chainages 21-27. The unwarranted deposition of cut and fill materials along the roadside need to be stopped and mitigated (Photograph 4).



Photograph 3: Clearing activities of roads from earthquake-induced landslides.



Photograph 4: Waste deposited from clearing activities need to be disposed.

2.3 Water Quality

45. The project has conducted its environmental baseline for water quality last January 24, 2018 and the samples were analysed at the NARI laboratory in Port Moresby. However, the contractor could not conduct in-situ environmental monitoring due to absence of equipment. This is a concern especially in Chainages 22-27 where spoil stockpiles are carried to the river during rainfall events causing the river to be very turbid.
46. A list of recommended in-situ equipment has been provided including possible supply sources and costs for water, air and noise has been provided. The equipment list is also part of the contractor's bill of quantities.
47. The PNG Environmental Water Quality Regulations of 2002 will be used as basis for baseline establishment and monthly compliance monitoring. The contractor has to conduct its monthly monitoring using the prescribed in-situ equipment.

2.4 Air Quality

48. The baseline for air quality was done using particulate pollution sampling for PM₁₀ and PM_{2.5}. It is recommended that monthly monitoring should be conducted using the in-situ equipment.

2.5 Noise

49. The baseline for noise levels were done last January and it is recommended that monthly monitoring for noise shall be done near construction and heavy equipment facilities, schools and communities/villages using the prescribed in-situ equipment. The ambient noise baseline that would be considered is 45dB.

2.6 Waste Management

50. The categories of wastes generated from the project consists of overburden from construction sites and improper disposal of spoils from excavation and other earth moving works such as clearing and grubbing. The contractor has obtained permission from landowners for the waste disposal. The proper disposal of camp wastes would also constitute this section. An agreement with owners of disposal sites is required for this purpose.
51. The contractor has installed trash bins at its camp site accommodation, office and yard from used drums as trash bins. However, there was no labelling of trash bins and separation of trash.
52. Wastes from the camp site are disposed at a landfill located at the back of the camp site. This activity should be assessed whether it follows the SWMP guidelines.
53. The old sewage pond outside the camp needs to be investigated to ensure that it does not pose risks to the environment. The Sewerage Management Plan has not been approved by DOW-ESSB.

2.7 Hazardous Materials Management

54. The storage and ultimately disposal for fluorescent bulbs, computers and peripherals, printers and other equipment will be monitored. Other monitored waste will include used batteries, battery fluids, oils, lubricants, and asphalt products.
55. The submitted Hazardous Waste Management Plan has not been approved by DOW-ESSB. The Materials Safety Data Sheet (MSDS) for these wastes will also be part of the HWMP to ensure the proper handling of these materials.

2.8 Aggregate Extraction

56. The Quarry Management Plan for all quarries has to be prepared individually. A submitted QMP has been disapproved by DOW-ESSB. The Wapu So-oro Limestone Quarry is in the process of obtaining its CEPA permit. Sumbol Quarry is being assessed for viability and a separate QMP will be provided for this purpose.
57. A Seminar - Workshop on Quarry Management and Closure Plan has been conducted last March 8, 2018 to provide some best practices in the preparation of these plans. Quarry sites must not be occupied, prepared or operated before the necessary land occupation permit, QEMPs and EPs have been obtained from the CEPA and other authorities.

2.9 Tree Removal and Vegetation Management

58. The contractor has felled some trees during its clearing and grubbing operation. The trees were given to the landowners. However, the contractor has to replace the felled trees.
59. All trees destined for removal should be marked together with the Environmental Officer of HRMG and only the marked trees are allowed to be removed. No tree shall be removed without the prior approval of the Engineer and any competent authority.
60. A seminar workshop on Tree Planting and Management was conducted on March 8, 2018 to provide basic information on this activity to ensure that it would be implemented and has been proposed to provide the Contractor with a plan to implement this activity.

2.10 Socio-economic Issues of Workers

The data on the socio-economic issues of workers in terms of employment indicate that for the six month period, the contractor employed a total of 665 workers of which 651 are men and 14 are women or 98% and 2% respectively. The displaced persons totaled 379 or 57% respectively (Table 2). ADB recommends 30% of employment should be women.

Table 2: Disaggregated Employment and Wages from January to June 2018

Month	Employed by Gender (Number)			Affected Persons Employed	Total Wages (Kina)
	Men	Women	Total		
January	42	0	42	15	12,015.00
February	37	0	37	20	9,412.00
March	64	3	67	43	16,112.00
April	91	3	94	51	39,148.00
May	197	3	200	120	78,571.00
June	220	5	225	130	151,200.00
Total	651	14	665	379	306,458.00
Average	109	2.3	111	63	51,076.00
Percentage	98 %	2 %	100 %	57 %	

2.11 Socio-Economic Issues of Community

61. The community benefits for the community is contained in Table 3 wherein expenditures from the camp in terms of purchases of food, construction materials, other purchases and other local expenses are detailed for the period.
62. Other benefits including royalties to the community for land rentals are detailed in Table 4. Benefits from quarry activities only started in April 2018.
63. The rent for the Contractor's camp is PGK 2,000 or a total of PGK 12,000 for the reporting period Table 5.

Community meetings are required to inform the communities of the project's presence and to provide information and education campaign activities. For the period, a total of 8 meeting consultations were conducted and attended by 107 participants Table 6.

Table 3: Expenditures/ Community Payments from January to June 2018

Month	Food purchase (Kina)	Construction Materials Purchase (Kina)	Other Purchase (Kina)	Other Local Expenses (Kina)	Total (Kina)
January	11,574.00	17,110.00	20,4660.00	3,350.00	23,6694.95
February	4,326.00	28,976.00	16,8192.00	3,353.00	20,4848.05
March	8,744.00	2,273.00	82,589.00	6,500.00	100,106.96
April	8,137.00	11,254.00	16,8671.00	20,600.00	20,5663.91
May	13,087.00	22,979.00	17,5550.00	38,520.00	25,0137.59
June	15,200.00	20,100.00	18,100.00	25,200.00	78,600.00
Total	61,068.00	102,692.00	817,762.00	97,523.00	1,076,051.46
Average	10,178.00	17,115.33	136,293.67	16,253.83	179,341.91
Percentage	6%	9%	76%	9%	100%

Table 4: Quarry Extraction from January to June 2018

Month	Volume of Quarry (Tons)	Estimated Value (Kina)
	Wapu Su – Oro	
January	NA	0
February	NA	0
March	NA	0
April	290m ³	3,770.00
May	1,704 m ³	22,152.00
June	2,500	32,500.00
Total	1,994 m ³	K2,991.00

Agreed amount of K1.50 per bucket / K13.00 per cubic meter

Table 5: Land Rentals paid from January to June 2018

Month	Amount paid (Kina)
January	2,000.00
February	2,000.00
March	2,000.00
April	2,000.00
May	2,000.00
June	2,000.00
Total	12,000.00

Table 6: Number of meeting and consultations from January to June 2018.

MONTH	Number of consultations	Male Participants	Female Participants	Total Participants	DPs who participated
January	1	6	0	6	6
February					
March	1	8	1	10	7
April	2	21	3	24	18
May	3	50	5	55	40
June	1	10	2	12	8
Total	8	95	13	107	79

2.12 Public Safety

64. The risk to public safety in terms of accidents was tragically illustrated with the death of a Chinese national from drowning at Wapu River during a heavy machinery accident. The risks from erosion and sedimentation of water bodies and home gardens need to be assessed for future road work activities. The use of Geographic Information Systems could serve as a tool for this activity.
65. A Contingency Emergency Response Plan also needs to be prepared by the Contractor which will mainly focus on the construction works that they will undertake in their specific areas of concern and the attendant potential risks and hazards.

2.13 Workers Health and Safety

66. Due precautions should be taken by the Contractor to ensure the safety and protection against accidents of all staff and labor engaged in the works, local residents in the vicinity of the Works and the public travelling through the Works. PPEs for all personnel, warning signs, first aid personnel and equipment should be provided.
67. The Contractor has submitted a Health and Safety Plan (HSP) which was approved by DOW-ESSU with operational details addressing health and safety concerns during his Works.
68. The Contractor has not been consistent in the provision of Personnel Protective Equipment (PPE) to all staff and labor engaged in the works to the satisfaction of the Engineer as contained in the prepared SHP.

2.14 Traffic Management

69. The Contractor has not provided traffic signs or traffic aides for its project implementation in violation of the approved Traffic Management Plan which require materials, equipment and human power.
70. The contractor has been advised to provide the required traffic management resources based on its stated TMP.

2.15 Prevention of HIV/AIDS and STDs

71. The Contractor has submitted an HIV/AIDS and STDs plan to DOW-ESSU but has not been approved. Negotiations are under way for a service provider, the Munihu Health Centre.
72. The contractor's HIV/AIDS sign board has been erected at both end of the project. One at the Nipa end and the other at the Munihu end (Photograph 5).



Photograph 5. HIV-AIDS STD Signboard

2.16 Existing Infrastructure Issues

73. A field verification activity was conducted to determine the undervalued and infrastructure that would be impacted last May 18, 2018. These settlements and payments are being worked out by HRMG.

2.17 Environment Related Grievances

74. There have been no reports on environment related grievances. However, these issues when they come need to be monitored by the Contractor, HRMG and PSC. The resolution of these issues have to be addressed by the Environment Grievance and Redress Committee which needs to be organized by the contractor.

2.18 Training and Mentoring

75. A seminar workshop on Solid, Liquid and Hazardous Waste Management was conducted by the International Environment Specialist on February 20, 2018 at the Kuri Lodge, Mt. Hagen City. The seminar was attended by participants from the contractors of Tranche 2 and 3 and Environmental Officers from HRMG (Photograph 6).
76. The International Environment Specialist likewise conducted a Seminar Workshop on Tree Planting and Management and Quarry Management Plan on March 8, 2018 at the Kuri Lodge, Mt. Hagen City. The seminar was attended by participants from the contractors of Tranche 2 and 3 and Environmental Officers from HRMG (Photograph 7).



Photograph 6: Seminar-Workshop on Solid, Liquid & Hazardous Waste Management.



Photograph 7: Seminar-Workshop on Tree Planting and Quarry Management.

77. A meeting was also conducted by the IES on the issues of Notice of Violations and Corrective Actions and the problems of quarry management last May 31, 2018 at Kimininga Hotel. The meeting was attended by all the Resident Engineers, Team Leader, Contractor's Representative, CSC Environment Specialist, HRMG Environment Officers, Contractor's Environment Officers and other participants (Photograph 8).



Photograph 8: Meeting on Notice of Violation for Tranche 2 and 3 projects.

3.0 CONCLUSIONS AND RECOMMENDATIONS

3.1 Conclusions

78. Considering that COVEC has just commenced its more environmentally sensitive activities, it is of some urgency that technical assistance is provided in the short term so that the required environmental plans and compliance monitoring requirements are done the right way and done on a timely basis.
79. There is a need to conduct monthly monitoring using in-situ equipment for the identified environment parameters. However, the contractor has to purchase the required equipment.
80. A perennial problem is the sewage treatment facilities which do not conform to best practices and should be done properly.
81. There is a need to revise and submit the Quarry Management Plan, HIV/AIDS & STD Plans, Hazardous Waste Management, Sewerage Waste Management, and Solid Waste Management Plans which were not approved by DOW-ESSU.
82. The CEMP and the various sub-plans need to be reviewed for their relevance, provide monitoring framework for their implementation, resources needed and the logistics required.

3.2 Recommended Actions

83. The experience from Tranche 1 and Tranche 2 indicate that the personnel recruited by the Contractor need capacity building. It is therefore important that these trainings, seminars and workshops need to be done as soon as possible to ensure that the Contractor's staff with the assistance of DOW-HRMG together with the PSC would benefit from these capacity and capability building activities (Table 7).

Table 7: Recommended Seminars and Trainings for Capacity Building

Activity Number	Item and Recommended Action	Responsibility	Completion Date
1	Training on the use of environmental In-situ equipment for monitoring.	HRMG-PSC-CWYC	August 2018
2	Seminar-Workshop on Traffic Safety.	DOW-HRMG-PSC-CWYC	August 2018
3	Seminar-Workshop on Environment Health and Safety Best Practices.	HRMG-PSC-CWYC	August 2018
4	Seminar-Workshop on Compliance Monitoring Reports, Documentation and Technical Writing.	HRMG-PSC-CWYC	September 2018
5	Seminar Workshop on Status, Issues and Concerns in the Implementation of the CEMP and other plans.	HRMG-PSC-CWYC	September 2018

84. The importance of identifying environmental harm then mitigating or remediating these harmful activities needs corrective action. In this case, corrective action could be categorized into two; corrections mean that there is immediate relief or action to an environmental problem. Corrective action refers to actions that would ensure that these environmental problems are not repeated either through policy or application of environmental management best practices (Table 8).

Table 8: Recommendations for Implementation and Corrective Action.

Non Compliance	Recommendations for Implementation	Corrective Actions Plan	In-Charge	Date of Implementation
Absence of monthly monitoring for identified environmental parameters.	Advise the contractor to conduct environmental monitoring using in-situ equipment.	Assist the contractor's Environmental Officer in the use of their equipment.	PSC HRMG	July-August 2018
Defective sewage system and discharges to the storm drain.	Contractor to repair defective sewage system.	Implementation of best practices for sewage treatment facility.	COVEC	July-August 2018
Submit or revise other plans including the HIV-AIDS Plan, Quarry Management Plans, Quarry Permits and others.	Review with the contractor the pending plans and assist in their accomplishment.	Provide a written notification to the contractor to submit and revise these plans.	COVEC	August – September 2018

APPENDICES

Appendix 1: List of References

1. Initial Environmental Examination for Nipa - Munihu Road section (2016).
2. Department of Works Specification for Road and Bridge Works 1995
3. Department of Works Specification for Road and Bridge Works 2015 Edition
4. Back to Office Report of HRMG Environmental Officer
5. Conformed Documents for the Improvement Works and Long Term Performance Based Maintenance Service (LTPBM) for Nipa - Munihu Road. Contract Number CSTB 3533.
6. Scherer, Thomas F. 2016. North Dakota State University Extension Service. Reviewed and Reprinted October 2016.
7. DOWL. 2015. Erosion and Sediment Control Best Management Practices Manual. Montana Department of Transportation. HIV Semi Annual Report
8. General Construction Waste Management and Hazardous Materials Handling and Waste Disposal DEC 1997.
9. Sample Environmental Baseline Procedure for Tranche 3 Projects. The Case of Pangia Wiri Loop Road.

Appendix 2: List of People Interviewed

1. Mr. Bienvenido Mirang – Resident Engineer PSC
2. Alphonse Niggins, Senior Field Coordinator, HRMG
3. Steven Sukot – National Environment Specialist, PSC
4. Paul Nombri, Manager, Technical Services, HRMG
5. G a r r y D u m , Environmental Officer, HRMG
6. Saul Nol – Environmental Officer, HRMG