

Semi-annual Report

July 2017

Town Electrification Investment Program – Tranche 1

Prepared by PNG Power Limited for the Asian Development Bank.

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TOWN ELECTRIFICATION INVESTMENT PROGRAMME TRANCHE 1.

Projects

1. Kimbe Bialla 66Kv Interconnection Transmission Line Project
2. Divune Hydro Power Project

Semi Annual Environmental Monitoring Report - No.1

Reporting Period: January to June 2017

**Prepared by PNG Power Limited Town Electrification Investment Program Project
Management Unit for Government of Papua New Guinea**

July 2017

ABBREVIATION

ADB	Asian Development Bank
AGJJVL	Joint Venture of AG Investment Limited & Huan Lishui Hydro & Power CO. Ltd
AIL	Angelique International Limited
CEMP	Construction Environment Management Plan
CEPA	Conservation and Environment Protection Authority
DHPP	Divune Hydropower Project
EMP	Environment Management Plan
EO	Environment Officer
EP	Environmental Permit
GoPNG	Government of Papua New Guinea
GRM	Grievances Redress Mechanism
IEE	Initial Environment Examination
IES	International Environment Specialist
HSE	Health, Safety and Environment
HP	Hydro Power
HSE	Safety Health & Environment
KBTL	Kimbe Biialla 66kV Transmission Line
km	kilometre
kV	kilovolt
LLG	Local Level Government
LO	Landowner
MFF	Multi Tranche Facility
MW	Megawatt
NBPOL	New Britain Palm Oil Limited
OHS	Occupational Health & Safety
PE	Project Engineer
PMU	Project Management Unit
PPL	PNG Power Limited
PRO	Project Relations Officer
SMEC	Snowy Mountains Engineering Consultants
SPO	Site Project Officer
TEIP	Town Electrification Implementation Programme
T1	Tranche 1
TL	Transmission Line
WNBP	West New Britain Province

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PART I: INTRODUCTION

1. The Government of Papua New Guinea (GoPNG) has requested the Asian Development Bank (ADB) to provide a multi-tranche financing facility (MFF) to develop hydropower resources to reduce reliance on diesel generation. It is the government's aim to have all household have access to reliable and affordable energy supply, and sufficient power is generated and distributed to meet the energy requirements and demand.
2. The Town Electrification Investment Program (TEIP) is a comprehensive plan to develop and enhance electricity in six sub-urban townships throughout the country as part of the government plan to reach out to majority of the total population.
3. The Implementing Agency (IA) for the TEP is PNG Power Limited (PPL), a government owned entity that is responsible for the generation and distribution of electricity throughout PNG. PNG Power Ltd (PPL) is the sole energy supply entity in PNG and is required to improve energy connectivity in PNG.
4. For Tranche One there are two sub-projects involved. The construction of a 3 Mega Watt (3MW) run-of-the river hydropower project (HP) at Divune, with associated transmission lines along Popondetta town to Kokoda in Northern Province and the second project is the construction of approximately 150 kilometres of 66kV transmission lines from the Lake Hargy Hydropower Plant in Biella to the Kimbe town of West New Britain province.
5. The objective of TEIP is to improve power supply in the provincial centers through replacement of high cost diesel power generation with sustainable renewable power generation, and to improve supply of clean electricity. Connecting the very high percentage of urban residents, who are not currently connected to the grid.
6. ADB classified the subprojects of tranche1 as Category B because the potential adverse environmental impacts were site-specific. Very few, if any, are irreversible, and most case mitigation measures can be readily designed. The appropriate level of assessment for Category B subprojects requires IEEs. An environmental feasibility study was carried out prior to commencement of works and documentation of the IEEs completed and disclosed on ADB website.
7. CEPA classified the subprojects of Tranche 1 as Level 2 B activities for constructing new 3 MW HPP and TL covering 150km. It required PPL to prepare a baseline environmental study and EMP. The projects also required Environment Permits (EP) for the two sites which were issued in 2014. PPL is the permit holder of the EP.

8. This is the second environmental monitoring report for tranche 1 projects. It incorporates EMP implementation status from on-site meetings, contractors' reports, environmental audits and general environmental issues observation for the two projects of Tranche 1 identified for the construction of Kimbe Bialla Interconnection Project and Divune Hydro power project. It covers the reporting period of monitoring for these projects from January to June 2017.

A. Construction Activities and Progress in the last six months

9. A1 Civil works under tranche 1 - Construction of 66kV TL in WNB

Contract Value:	USD 27.33 Million
Contract Period:	24 months
Contract Start:	14 March 2015
Construction:	Commenced 11 July 2016;
Target:	Completion by September 2017.
Contract Completion:	21 December 2017

Project Scope includes:

10. All design engineering, procurement, supply, construction and installation required for the completion of the 66-kV transmission line interconnecting Kimbe to Bialla, comprised of:
 - a. Design, fabrication and supply and erection of Steel poles support structures, cross arms, bolts, nuts, washers, D shackle, support stays and all other accessories such as step bolts, phase, danger, pole and circuit identification plates, anti-climbing guards and earthing.
 - b. Design, fabrication and supply and erection of ACSR conductor and OPGW Earth wire including its accessories.
 - c. Design, fabrication and supply and erection of Insulators and insulator hardware clamps and accessories.
 - d. Design and selection of foundations for pole support structures and others. Line design and pole spotting on preliminary line route profiles provided based on the technical specification.
Design and supply of special structures for the selected river crossings provided as shown on the drawings including the design, supply and installation of special foundations for the structures.
 - e. Design, fabrication, supply and erection of Terminal structures for connections to substations. Design, fabrication, supply and erection of 22kV/ 33kV step-up and 33kV/22kV step-down transformer substation.
 - f. Design, fabrication, supply and erection of 33kV Auto re-closer and Air-break switches

g. Construction and erection of poles over the 150 km alignment

11. Status of implementation to 30 September 2017 is summarized below.
12. **Route Survey:** Surveys undertaken by the contractor for the following two sections: (i) 122-km length from Mai Junction to the proposed Bialla Sub-station site and (ii) the 20-km. section from Bialla substation to Lake Hargy Hydropower station, are complete.
13. PNG Power Ltd. requested for a survey of the 20-km of section from Bialla substation to the Lake Hargy Hydropower facility be undertaken to replace the 20-km section from Kimbe to Mai Junction completed by PPL in 2014.
14. A post-survey revised Bill of Quantity (BOQ) for the full length of 142 km, inclusive of the special poles for river crossings resulted in a 9.83% increase over the original contract amount.
15. **Monopole Design:** The specific design of the monopole was evaluated from a field of four options. PPL chose self-standing Monopoles mainly to avoid additional compensation payments for rights-of-way along the T/L corridor. The original design using stay with guy wires required a horizontal distance of 15 meters from the pole. The redesigned self-sustaining monopoles have a 5-meter diameter at the widest section well within the 15-meter corridor. The design was approved by PPL in late December 2015.
16. **Procurement of Materials:** 97% of materials were delivered to site by end December 2016. The remaining three per cent (3%) is mainly comprised of the remaining 28 special river crossing poles and substation lines that will be delivered by February 2017. The monopoles number 1,243 for the 122-km segment from Mai to Bialla, and 209 for the 20-km segment from Bialla to Lake Hargy, for a total of 1,452.

A. 2 Civil works under tranche 1 - Construction of a Divune HP in Oro

17. Divune Hydropower Project

Contract Value:	US\$14,435,000.00
Contract Period:	24 months
Contract Signed:	18 August 2016
Contract Finish:	July 2018

Project Scope:

18. Design, construction, supply, procurement and installation works of a run-of-river type hydropower project with an installed capacity of 3 MW at the generator terminals.

- a. Detailed engineering and design of all civil and structural works
- b. Construction of Temporary and Permanent camps
- c. Access Roads, River crossing, stock yards, dump yards, quarries
- d. Weir, Intake and Conduit
- e. Sedimentation Basin & Forebay
- f. Penstock
- g. Power House
- h. Draft tube & Tail Race channel
- i. Switchyard
- j. Gates
- k. Commissioning & testing

Project progress for Tranche 1 project

19. Progressive activities on the two sub-project sites as of ending of June 2017 are outlined below in table 1.

Kimbe Bialla Interconnection 66kV Project - West New Britain
<p>Progress works Updates: 1234 poles have been erected from Mai Junction in Kimbe to Tiaru Bridge covering 118km. Tower poles river crossing erection and other skipped location are in progress Stringing covering 104km from Mai junction to Tiuru Bridge Bialla.</p>
<p>Workforce: split into two groups. 1. Pole erection 2. Stringing. Total # of Workforce: 72 Local workforce: 8 Overseas workforce 48. Two additional safety crews included for road traffic control.</p>
<p>Clearance: for stringing to be done along Hamamas Bridge, Kapuira, Amu River, Malilimi Plantation and all the way up to Bialla</p>
<p>Constraints: rainy season has started and will continue for another three months.</p>
Divune Hydro Power Project –Oro Province
<p>Progress Works update: Major activities carried out during this reporting period include;</p> <ol style="list-style-type: none"> i) The site clearing activities at the powerhouse and transformer yard and the excavation activities for the diversion channel from Umaru Creek ii) The site clearing for the diversion channel from Umaru Creek was also completed and excavation of the channel is also progressing. iii) The construction of the cement warehouse at the batching plant was also completed in this month. iv) Extraction of the River gravel at Kumusi River v) Establishment of workshop, workers camp, fabrication workshop and site office.

Workforce: 40 local employees (2 females) and 25 foreigners currently employed (3 females).
Constraints: flash rains and LO issues on weir site –to be resolved by PPL

Table 1: Progressive update of construction work on T1 projects

B. Changes in Organisation and Environmental Management

20. The environment and safeguard unit within the PMU consist of an environment officer, a gender specialist and two lands officers. Assistance also is sought from an International specialist consultant from SMEC. The contractors for both project of T1 also have units set up to monitor environment and safeguard and report to the PMU. This unit closely monitors the compliance with all safeguards requirements during the implementation of the TEIP.

21. The PMU Environment Officer is responsible for;

- Monitor Contractors EMP (CEMP)
- Conduct environment site audits
- Issue noncompliance notices
- Monitor contractor’s monthly reports
- Provide 6 monthly environment monitoring reports to ADB
- Resolve environment grievances

22. The PMU Gender Specialist responsibility;

- Ensure contractors employ 30% of women as part of workforce skilled or unskilled local and international
- Conduct or coordinate HIV/AIDS awareness
- Conduct or coordinate finance literacy and electricity awareness
- Provide 6 monthly reports to ADB on social safeguards

23. PMU Lands Officers roles and responsibilities;

- Resolve land issues and grievances
- Conduct land investigations
- Negotiate with landowners
- Prepare MOU/MOA between landowners and PPL
- Conduct land compensation verification and payments

24. International Specialist engaged alternatively to;

- Strengthening the environmental management of the project during detailed design, bidding process, contract process, construction, and implementation,

- Supervision and guidance of the environmental assessment process for all subprojects under the MFF,
- Supervision of the EMP implementation of subprojects, and
- Undertaking the necessary institutional strengthening including on-the-job training for the EO of PPL by giving major tasks to the EO in all of these activities

25. The contractor (AIL) of Kimbe Bialla 66kV TL Project has an HSE Officer and also has engaged safety assistance on temporary basis whenever required to assist the HSE Officer.

Responsibilities involve;

- Implementation of CEMP
- Site monitoring and reporting on health, safety and environment
- Submitting CEMP monthly reports to PPL
- Community liaising

26. The contractor for DHPP (AGJJV) recently recruited a HSE Officer. Responsibilities involve;

- Implementation of CEMP
- Site monitoring and reporting on health, safety and environment
- Submitting CEMP monthly reports to PPL
- Monitoring water quality
- Community liaising

27. External environment monitoring and audits will be conducted by CEPA based on the environment permit of the project on a yearly basis.

C. Relationship with Contractors, lenders, owners etc.

28. TEIP PMU ensures of availability of all environmental information and facilitates environmental supervision of the/projects. The TEIP PMU through its EO reports to the ADB every 6 months on the status of environmental compliance of construction works.

29. The status of environmental permits and licenses submitted by the contractors/sub-contractors are reflected in the Table 2 below:

ITEM	STATUS	COMMENT
Kimbe Bialla 66kv TL Interconnection		
Permit for cutting of grass, bushes and trees, located on construction site	Not needed	Restricted to road easement corridor

Inventory of Emissions of hazardous substances in to ambient air from batching plant	Not needed	Contractor buys concrete from subcontractor Nivani
Disposal of municipal and construction waste	Yes	Permit obtained from CEPA for disposal to local land sites
Divune HPP		
Permit for cutting of grass, bushes and trees, located on construction site	Not needed	Land plot is a property of PPL. It is not needed to take any permission for cutting of grass, bushes and trees located on construction site.
License for borrow pit and crusher plant	Yes	Covered in Environment Permit obtained from CEPA
Inventory of Emissions of hazardous substances in to ambient air from batching plant	Yes	Covered Environment Permit obtained from CEPA
Disposal of municipal and construction waste	Yes	Permit obtained from CEPA for disposal to local land sites.

Table 2: Environment Permits and License

PART II: ENVIRONMENTAL MONITORING

D. Monitoring Method

30. Environmental monitoring is carried out by the contractor, PMU Project Engineer; the Site Supervisor with the assistance from the EO. Environmental audits are carried out on a quarterly basis by the EO. A weekly monitoring is conducted by the Project Engineer and the Site Supervisor in coordination with the contractors' Environmental Representative. Monitoring is performed continuously with reporting done every month by the contractor to Project Site Engineer and/or the EO of the Contract based on their CEMP.
31. A project specific environmental monitoring checklist has been prepared by the contractor with inputs from the EO. The checklist is used for daily/monthly monitoring as well as the audits which is carried out on a quarterly basis. A CEMP monitoring checklist for quarter is used to monitor the activities carried by the contractor.

Component 1: Construction of 66kV TL from Kimbe to Bialla West New Britain Province

32. During site inspections, the HSE Officer of the Contractor PMU PE and EO monitored the following areas:

- Contractors' site establishment & lay down area,
- Construction works on pole erection and stringing along highway
- Workers camp,
- OHS for permanent workers,
- Nearby communities/settlements consultation, and
- Local participation

33. For this reporting period an environmental audit was conducted on the 11th of April.

34. Figure 1 below shows the general schedule for environment monitoring for the BKTL project. The schedule outlines from the time of CEMP preparation and approval to the monitoring of CEMP activities. Monthly reports are monitored from the time of CEMP approval. Site visits are conducted quarterly and reporting done biannually.

		SCHEDULE																																										
		2016												2017												2018																		
TASK	ACTIVITIES	Q1			Q2			Q3			Q4			Q1			Q2			Q3			Q4			Q1			Q2			Q3			Q4									
		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC							
CEMP	Contractor Provide within 30 days before any works start																																											
	Draft CEMP assessed																																											
	Final CEMP																																											
	MONITORING OF CEMP																																											
	Monthly Reporting of CEMP by contractor																																											
	Site Visit																																											
	meeting with Contractor HSE/EO officer																																											
	Assessing of CEMP																																											
REPORTING	Biannual Report to CEPA and ADB																																											

Table 3 Monitoring Schedule KBTL

Component 2: Construction of 3MW Hydro Project Divune Oro Province

35. During site inspections, the HSE Officer and site project Manager of the Contractor PMU PE and EO monitored the following areas:

- Contractors' site establishment & lay down area,

- Construction works at penstock, weir site and powerhouse
- Workers camp,
- Batching plant
- Crasher plant
- New access roads
- OHS for permanent workers
- Nearby communities/settlements consultation, and
- Consultation with communities upstream and downstream

36. Similarly, to KBTL for DHPP, the table below shows the monitoring schedule.

Project :	DHPP	SCHEDULE																																															
		2016												2017												2018																							
TASK	ACTIVITIES	Q1			Q2			Q3			Q4			Q1			Q2			Q3			Q4			Q1			Q2			Q3			Q4														
		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC												
CEMP	Contractor Provide within 30 days before any works start																																																
	Draft CEMP assessed																																																
	Final CEMP																																																
MONITORING OF CEMP	Monthly Monitoring Reports submitted by Contractor																																																
	Site Visit																																																
	meeting with Contractor HSE/EO officer																																																
	Assessing of CEMP																																																
REPORTING	Biannual Report to CEPA and ADB																																																

Table 4: Monitoring schedule DHPP

E. Monitoring Results

37. The monitoring results as noted below in the two tables respectively are from site visits and contractors CEMP monthly monitoring reports.

Component 1: Construction of 66kV TL from Kimbe to Bialla West New Britain Province

ACTIVITIES	MONITORING RESULTS
Site Clearance	Completed up to 85%. Strictly maintained along 15meter easement corridor. No complaints so far from communities. A few grievances on tree compensation.
Noise, Dust and Vibration	Noise is not an issue due to the scope of work and no complaints from communities Dust is not issue due to sealed roads. No complaints from communities.
Cultural significant areas	No complaints from communities
Workers Camp and facilities	Main camp based at Kapuira and temporary camp sites situated at the Tiaru Bridges. Security is provided and adequate rations given. No complaints from workers.
Waste Management	An issue at the workers' camp where rubbish metals and construction materials are not put into proper bins. However, waste water is diverted into proper drainage system.
Workers Health and Safety	Conditions in workers' camp are to be kept well. At times, most of the foreigner workers are sick due to the adjusting to the environment conditions and common diseases.
Protection of forest resource and sensitive ecology	Most areas along the highway have been protected by the buffer zones and construction is restricted to the easement only. No complaints from the communities.
Material transport	Risky along the highway as the job requires materials to be moved from the storage area to construction site. So far near accidents have been minimised and avoided with licensed drivers, and driving at the limited speed. Load is also controlled.
Storage and Handling of lubricants and fuel	Fuel handling is an issue where it is being done near camp quarters and kitchen area. Corrective actions have been taken by contractor.
Management of Hazardous Materials Explosives, Combustibles and toxic materials	No, hazardous materials stored on site. No complaints from communities.
Increased Traffic and Operating Speeds	Maintained. No complaints from communities. Assigned officers to control traffic.
Community Health and Safety	AIL has conducted safety and HIV awareness to communities along the project corridor as a follow up to PPL safety and HIV/AIDS awareness. No issues raised by the communities.

Table 5: Monitoring results on main activities KBTL

Component 2: Construction of 3MW Hydro Project Divune Oro Province

ACTIVITIES	MONITORING RESULTS
Site Clearance	Clearance has been done from the powerhouse, penstock and workers accommodation. For the weir site, it has been blocked off by Landowners over internal issues. This issue to be resolve by PPL.
Noise, Dust and Vibration	Dust is not an issue since it often rains in the area. Noise has been limited between working hours only from 7am to 6pm. No complaints from communities.
Cultural significant areas	Significant landmark at batch plant including drinking hole has been disturbed and needs to be cleared and returned to original setting. Complains have been received from one of the clan leader. The Contractor was issued a noncompliance notice and will address immediately and a follow up monitoring will be conducted in three weeks' time.
Workers Camp and facilities	There are two camp quarters. A workshop, mess and office within project site. Common living facilities are provided for both local and international employees. However, rations for local employees are not adequate and a notice of non-compliance has been issued on the matter
Waste Management	An issue at the moment. A waste management plan will be provided by contractor to address the issues, as well as provision of waste bins, recycling methods and landfill sites will be established.
Workers Health and Safety	Workers lack appropriate PPE and a notice of noncompliance has been issued to address the issue
Protection of forest resource and sensitive ecology	Most areas around the project site had been disturbed and construction works is carried out well within project boundary.
Material transport	All materials transported to site carefully. Licensed drivers are employed and no accidents were reported at the time of reporting.
Storage and Handling of lubricants and fuel	Fuel handling is an issue and a notice of noncompliance has been issued to rectify the issue.
Management of Hazardous Materials Explosives, Combustibles and toxic materials	Not stored at the project site at the time of reporting.
Increased Traffic and Operating Speeds	Maintained. No complaints from communities. Assigned officers to control traffic.
Community Health and Safety	<p>HIV/AIDS awareness was conducted by PMU GSO in January 2017. Community consultation was conducted during the time of site audit in with two communities living upstream (Waju) and Sisireta (downstream) During community consultations issues raised as follow;</p> <ul style="list-style-type: none"> • Water for drinking has to be sourced from elsewhere which is a walking distance for both villages • Safety of the community is paramount especially children going to school along the road. • No rubbish should be thrown into river, solid waste and liquid waste as well. • Some complained about the dust and speed limit of the big trucks. • Diarrhoea and stomach ache had affected people (Waju and Sisireta) drinking from Divune and now have ceased to drink from the river.

ACTIVITIES	MONITORING RESULTS
	<ul style="list-style-type: none"> Awareness should be provided on the social impacts of the project if the construction comes into full force. Concerns raised especially by mothers. Community of Waju want to revive health centre and asked if we could assist <p>Access to site needs to block off from the public at the moment there is no restriction or barrier around construction site and people are just walking through the project site. A noncompliance notice has been issued to contractor to address the issues.</p>
Stockpiling of top soil	An issue. A Notice of non-compliance issued to contractor and issue being rectified. A follow up monitoring will be conducted in three weeks.
Access road construction	Drainage needs to be provided along the road side to get rid of puddles that provides environment for breeding mosquitoes. A notice of noncompliance has been issued to the contractor to rectify the issue. A follow up monitoring will be conducted to ensure the issue is resolved.
Invasive Species control	All vehicles brought into site have gone through quarantine and has been cleared. No complaints from communities' employees venturing into customary land.
Works alongside stream channel	No work is being carried out during high flow periods. However, quarterly monitoring for quality is to be done by contractor to ensure water quality is in line with CEPA water quality criteria. Contractor has been advised to do that and this shall be monitored in the next reporting period.

Table 6: Monitoring results on main activities DHPP

PART III: ENVIRONMENTAL MANAGEMENT

F. Environment Management System

38. PMU EO carried out on-site monitoring to check environmental compliance of construction works and effectiveness of supervisory company's activities. Records of on-site environmental monitoring are kept at PPL site project office. The contractors are responsible for submit monthly monitoring reports.

39. The environmental officer has created a project environmental safeguard files and an electronic track record system.

MANAGEMENT PLAN	STATUS	
	<i>KBTL</i>	<i>DHPP</i>
CEMP	Approved	Approved
Fire prevention management plan	Approved	Not yet
Oil Spill Emergency Response Plan	Approved	Not yet
HS Plan	Approved	Not yet

Table 7: Status of Management Plans

G. Site Inspections and Audits

40. Site inspections are carried out two times during the six-monthly period or on quarterly basis. Site inspections are conducted in association with the PE and Contractors site HSE or Environment Officer.
41. Monthly monitoring reports and audits are carried out by the contractor and reports submitted to the PMU. Monitoring visit was conducted jointly by AIL and PMU PE and EO during the reporting period. During the field visits a number of HSE issues were noted and brought to the attention of the EO and the AIL Management. Mitigation measures were then discussed with the contractor on-site and detailed written instructions were given.
42. Site visit to DHPP was conducted on the 18th -19th June 2017. During site visit a list of issues were identified by the PMU PE/EO. A meeting was conducted with the contractors HSE officer and Project Site Manger to address the issues identified. Followed by a notice of non-compliance issued on the 21st June 2017.

H. Non- Compliances

I. Non- compliance at KBTL

43. Non- compliance was given on the issues waste management, general camp hygiene especially in kitchen area and mishandling of oil fuel at the camp site of Contractors. Observations of such happened during first quarter site visit in April. Figure 1 show photos of observation at camp site where oil/fuel handle in kitchen area rather than a designated area.
44. Internal audit from AILs HSE section issued non - compliance and corrective actions were carried out by the contractor as shown in the correction action plan.



Figure 1: Issues at KBTL camp site at Kapuira

II. Non - Compliance at DHPP

45. The first site visit to DHPP resulted in a lot of issues being raised and CEMP not being complied with. A notice of noncompliance was issued to the contractor on the 21st June 2017. Deadline to correct of issues is on the 31st July 2017. Upon observation of construction site, not all mitigation measures (mm) were complied with in the CEMP. PMU EO to ensure the contractor complies through regular follow-ups and site visits which will be reported in the next reporting period.

46. Issues identified and needs corrective actions;

ISSUES	EMP/CEMP CONCERNS
<p>Camp sites/ Storage and workshop – Divune River</p>	<ul style="list-style-type: none"> • Waste management – provision of bins and segregation/recycling of waste. no proper landfill sites • Rations of local workers not adequate and fair • No proper standard PPE provided to all workers fully from shoes, gloves, eye protector, vest this issue was raised by employees and also identified during the monitoring period. • Workers camp toilet facilities need to be cleaned regularly • Surface runoff from ablution blocks need proper drainage • Need for proper storage and disposal of empty fuel drums and scrape metals
<p>Construction site – Divune River</p>	<ul style="list-style-type: none"> • Soil erosion and sedimentation issues due to exposed soil and rain • Need proper drainage for surface runoff • access road needs drainage • Proper stockpiling of top soil and excessive soil and avoid dumping onto boundary side causing intrusion into landowners land boundaries. complaints received from community Waju • No proper drainage and covering of stockpile area to avoid soil erosion and sedimentation • Fencing from construction site from the public as to avoid accidents • Provide oil separators to avoid oil /fuel exposure • Heavy vehicle drivers must be qualified driver and be aware of the speed limit along the access roads near schools and communities so as to avoid

Batching Plant – Divune River	accidents. Speed limit signs must be used.	
	<ul style="list-style-type: none"> • Significant landmark at batch plant and drinking hole has been disturbed and needs to be cleared and not disturbed. Complains received from clan leader. • Provide proper drainage area for batching plant 	<ul style="list-style-type: none"> • Chance of Discovery of archaeological and cultural site • Site Establishment
Crusher site –Illimo / Kumusi River		
	<ul style="list-style-type: none"> • waste removal of metal scraps • provide appropriate PPE for employees • fence of area from public as to avoid accidents • provide proper rations and accommodation for local employees • silt from sediment pond has to be removed and reused for landfill site 	<ul style="list-style-type: none"> • Site establishment • Spoils • Waste management • Community Safety • Workers Camp and establishment/ incoming workers

Table 8: Issues Identified at DHPP

I. Corrective Action Plans

I. Corrective Actions - KBTL

47. Following the notice of compliance, the contractor has applied corrective measures as shown below in figure 2 to resolve mitigating the issues of waste and fuel handling. Also in their own internal audit the issues observed were corrected as per audit report as shown in table 10.



Proper waste bins provided



Kitchen area free of fuel oil and designated to located area away from the kitchen area

Figure 2 : Corrective actions done to noncompliance issued

EMS observations from internal audit with corrective action taken

<i>Observations</i>	<i>Corrective action</i>
<i>Kitchen wet waste landfill at store was not barricaded and also mixture of waste found in the landfill.</i>	<i>Landfill will be barricaded and designated bins have been allocated for segregation. Also frequent awareness and communication are given to workers.</i>
<i>Auditor observed the evidence of fuel wood found available at Security makeshift house inside store yard. Also recommended that security camp shelter shall remove from inside store yard and relocate to outside the premises.</i>	<i>Avoid repetition of such acts it is recommended to shift outside of store yard.</i>
<i>Health and Hygiene was not captured in the monthly CEMP and Safety reports.</i>	<i>HSE to create a section and to elaborate on health and hygiene issues in both monthly reports.</i>

Table 9: Internal audit issues and corrective actions

II. Corrective Actions - DHPP

48. For DHPP, this was the first audit conducted only in June 2017 since construction mobilisation was in November 2016. There was a long list of defects observed during the audit. Ongoing monitoring of corrective actions will be reported in the next reporting period. However, below in table 9 outlines the issues and corrective actions required. A copy of the issues listed below has been forwarded to the contractor to address accordingly.

ITEM	DEFECTS	CORRECTIVE ACTION REQUIRED	DEADLINE	IMPLEMENTATION STATUS	RESPONSIBILITY
Workers Camp and Storage Area – Divune					
1	Proper standard PPE to be provided to all workers fully from shoes, helmets gloves, eye protector, vest	Need to be worn at all times during working hours as part of safety.	31/07/17	This will be implemented by the contractor immediately	Contractor
2	No proper waste disposal area	<ul style="list-style-type: none"> Contractor need to provide a proper waste landfill site apply safe disposal methods of waste Waste management plan has to be done by HSE 	31/07/17	This will be implemented as soon as possible by the contractor	Contractor
3	Local employees lack proper rations	<ul style="list-style-type: none"> Adequate rations must be provided to local employees three times a day A local cook must be employed to provide separate meals for local employees. 	31/07/17	To be verified on the target date	Contractor

ITEM	DEFECTS	CORRECTIVE ACTION REQUIRED	DEADLINE	IMPLEMENTATION STATUS	RESPONSIBILITY
4	Workers camp 1 lack hygiene and sanitation	A cleaner must be hired to clean toilet facilities for the employees	31/07/17	To be verified on the target date	Contractor
5	Workers camps lack waste bins	Waste bins need to be provided in camp site.	31/07/17	To be verified on the target date	Contractor
6	Surface runoff from ablution blocks need proper drainage camp 1 and 2	Proper drainage must be provided to drain out excessive water	31/07/17	To be verified on the target date	Contractor
7	No proper storage for scrap metals	Provide proper storage of all scrape metals such as a container or recycle	31/07/17	To be verified on the target date	Contractor
8	No proper storage of empty fuel drums and oils	<ul style="list-style-type: none"> • Provide proper storage for empty fuel drums and oil in one designated area away from water sources • Empties must be disposed of properly or recycled. 	31/07/17	To be verified on the target date	Contractor
Construction Site – Divune					
9	Soil erosion and sedimentation	<ul style="list-style-type: none"> • Exposed soil should be stockpiled in one area and covered to avoid rain. • Provide drainage around stockpile area 	31/07/17	To be verified on the target date	Contractor
10	No proper drainage for surface runoff	Drainage must be provided for surface runoff along slope area to avoid erosions	31/07/17	To be verified on the target date	Contractor
11	No proper drainage for access road	Provide proper drainage for new excess road as to avoid puddles breeding mosquitoes	31/07/17	To be verified on the target date	Contractor
12	No proper stockpiling of top soil and excessive soil dumped	Need to avoid dumping excessive soils along boundaries of project site and stock pile all exposed soil	31/07/17	To be verified on the target date	Contractor

ITEM	DEFECTS	CORRECTIVE ACTION REQUIRED	DEADLINE	IMPLEMENTATION STATUS	RESPONSIBILITY
	along boundary side infringing landowners land boundaries				
13	Construction site is exposed to public	Put barrier tapes around construction site and signs advising communities not to enter project site unnecessarily	31/07/17	To be verified on the target date	Contractor
14	No oil separator provided at workshop area	Provide oil separators at workshop area and that this oils/fuel empties are disposed of correctly or recycled	31/07/17	To be verified on the target date	Contractor
Concrete Batching Plant – Divune					
15	Due to no stockpiling, excessive dirt pushed over the boundary site has caused disturbance to waterhole, a significant cultural landmark	Debris must be removed and gabion baskets provided to preserve waterhole.	31/07/17	To be verified on the target date	Contractor
16	No drainage for batching plant to control waste water runoff	<ul style="list-style-type: none"> • Proper drainage area must be provided for batching plant. • Provide design for drainage 	31/07/17	To be verified on the target date	Contractor
Crusher – Illimo/ Kumusi					
17	Waste metal and rubbish laying around area	Exposed waste must be removed and disposed of properly or recycled	31/07/17	To be verified on the target date	Contractor
18	Lack of storage area for oil/ fuel	<ul style="list-style-type: none"> • Contractor must provide proper storage area for oil and fuel drums. 	31/07/17	To be verified on the target date	Contractor

ITEM	DEFECTS	CORRECTIVE ACTION REQUIRED	DEADLINE	IMPLEMENTATION STATUS	RESPONSIBILITY
		<ul style="list-style-type: none"> Empties must be disposed of properly or recycled. 			
19	Local employees have no proper PPE	Appropriate PPE for employees must be provided such as eye protective glass, gloves and shoes.	31/07/17	To be verified on the target date	Contractor
20	Work area exposed	Area of crusher site must be fenced off from resident area and public access so as to avoid unnecessary people entering site.	31/07/17	To be verified on the target date	Contractor
21	Lack of proper accommodation and rations for local employees	Adequate rations (3 meals a day) and accommodation for local employees must be provided	31/07/17	To be verified on the target date	Contractor
22	Siltation build up and exposure	Silt from sediment pond must be removed and reused for landfill site	31/07/17	To be verified on the target date	Contractor

Table 10: Corrective Actions required for DHPP

J. Grievances Redress

49. Both project sites of T1 have GRM process, however the GRM is not that effective as expected. Most issues especially regarding land are directly referred by the communities and the contractors to PPL PMU. It starts with the complainant approaching the project site officer and if the project site officer can't handle the issues, it is being referred straight to the Project Manager for redressing of these issues. Usually, on site there is a GRM form to be filled out by the Site Project Officer (SPO) hence not effective.

50. As per the GRM process, the issues are to be resolved at the village level through the ward councillors however; most times it's not the case. The issues come straight to PPL. The contractors have employed their PRO to deal with any issues from the communities. However, issues arising from the communities come directly to PPL.

ISSUES	LOCATION	REDRESS
<p>No environment complaints received in this monitoring period except for complaints received from clearance delayed payments from APs</p>	<p>KBTL</p>	<p>Referred to PPL to resolve.</p>
<p>During consultations with communities a few environment issues that were raised will be addressed accordingly such as;</p> <ul style="list-style-type: none"> ➤ Stockpiling of soil being pushed over boundary areas into LO land ➤ Waste management ➤ Cultural site being disturbed ➤ Road safety ➤ Water quality <p>Land issue regarding the blocked access to the Weir continued. By the end of this month, a total of Sixty-Six (66) days have gone by since the blockage.</p> <p>The Project owner (PPL) is aware of this and will update the contractor in due course.</p>	<p>DHPP</p>	<p>Referred to Contractor to resolve. PPL to monitor and ensure issues are resolved.</p> <p>Referred to PPL to resolve.</p>

Table 11: Grievances of T1 Projects

K. Consultation, Disclosure and Participation

Consultation with Communities - DHPP

51. Two Consultation meetings were conducted at Sisireta and Waju to address grievances and find out the impacts of the construction of project on the communities. The outcomes of consultation were as follows;
52. Divune river has been the main water source for these two villages Waju- upstream of the project and Sisireta –downstream of the project, now they cannot drink from the river since start of the project construction due to turbidity change for people living at Sisireta, and the incident were sewerage tank was spilled into the river due to flash flooding from the Omaru creek.
 - Water for drinking has to be sourced from elsewhere which is a walking distance for both villages
 - Safety of the community is paramount especially children going to school along the road.
 - No rubbish should be thrown into river, solid waste and liquid waste as well.
 - Some complained about the dust and speed limit of the big trucks.
 - Diarrhoea and stomach ache had affected people (Waju and Sisireta) drinking from Divune and now have ceased to drink from the river.
 - Awareness should be provided on the social impacts of the project if the construction comes into full force. Concerns raised especially by mothers
 - Community of Waju want to revive health centre and asked if we could assist

PART IV: CONCLUSION AND RECOMMENDATION

For the tranche 1 projects, KBTL CEMP compliance is 70% and DHPP at 30% in terms of adoption of environmental/ social impact control/ mitigation measures, environmental training/ induction of workers, environmental monitoring, impact corrective actions, and periodic reporting. However, for KBTL there was an improvement in monthly monitoring reports being submitted on time, except for DHPP there is need for improvement in monthly monitoring of CEMP.

53. The following actions are recommended;

A. Recommendation for KBTL

- Enforce waste management plan
- Fuel handling at appropriate places and not near camp area

B. Recommendation for DHPP

- AGJJVL to address all issues given out by the compliance notice on issues mentioned above. PMU EO/PE giving three weeks to address all issues.
- AGJJV to employ an HSE or environment site officer to implement task
- Contractor/ PPL to Improve on communication barriers
- Contractor and PPL to engage more with communities
- Continuous monitoring by Contractor of water quality must be done to ensure the quality of water complies with CEPA water criteria
- PPL/AGJJVL to provide temporary water tanks and eventually provide water supply for the villages
- Contractor HSE Officer to provide a HS Plan, waste management plan and fire emergency plan.
- Contractor PRO to keep record of grievances of communities and liaise with communities by providing updates on project and carrying out awareness on project progress.
- PPL and contractor HSE Officer to liaise with provincial health department to arrange reopening of clinic and supply of medicines.
- Contractor to improve on submitting of CEMP monthly monitoring reports on time.

ANNEXES

Annex 1: CEMP Compliance & Inspection Monitoring Form KBTL

Project : Bialla Kimbe 66KV Interconnection Project

Implementing Agency : PNG Power Ltd

Scope of Inspection: site inspection of CEMP MM

Contractor : Angelique International Limited (AIL)

Weather Condition: dull and cloudy, few showers

Attendees: Name & Position: AIL HSE Officer, TEIP PE/ EO

Date : 11th April 2017

Construction Activity	Mitigation Measure (CEMP)	Mitigation Implemented Yes/No/Partial	Defect Notice Corrective Action Required Including Deadline
Community consultation and grievance reporting	MM01 awareness of project conducted during construction	YES	
	MM02 involve youth labour	YES	
	MM03 GRM shall be put in place, the committee will have our SHE (from local community) representative from PPL and community	YES	
Community Health and Safety	MM04: AIL to instruct drivers on safety	YES	
	MM05: Arrange community HIV/AIDS awareness	YES	
	MM06: community access to work place will be barred and controlled by Marshalls	YES	
	MM07: a record of complaints received from public will need to be maintained. AIL to keep record and make it available to PPL and included in CEMP monthly report prepared by AIL	YES	
Mobilization: Establishment of contractors base camp and facilities	MM08: camps shall not be located near settlement or near drinking water supply intakes. No trees shall be cut or removal of vegetation shall be minimised.	YES	

Construction Activity	Mitigation Measure (CEMP)	Mitigation Implemented Yes/No/Partial	Defect Notice Corrective Action Required Including Deadline
	Construction camp sites should be placed on flat ground wherever this available.		
	MM09: site camps location has been selected close to existing inhabitants	YES	
	MM10: Proper toilets having proper waste management and pre- engineered fabricated containerized accommodation	YES	
	MM11: area will be secured -Fenced	YES	
	MM12: Proper camp facilities such as kitchen, waste bins provided	YES	
	MM13: Proper waste water management	PARTIALLY	Defect Notice given Deadline for corrective action-14/07/17
	MM14: workers excess to clean water	YES	
Workers Health and Safety	MM15: provide safety training to all workers and HIV / AIDS awareness	YES	
	MM16: Workers safety wear worn always during construction	YES	
	MM17: ensure drugs and alcohol free	YES	
	MM18: first Aid provided and trained personal to administer	YES	
	MM19: induction of workers on site and hazard and safety measures explained to workers	YES	
	MM20: review workplace and safety once a month	YES	
	MM21: Keep record of accidents and time lost from accidents.	YES	

Construction Activity	Mitigation Measure (CEMP)	Mitigation Implemented Yes/No/Partial	Defect Notice Corrective Action Required Including Deadline
<i>Protection of forest resource and sensitive ecology</i>	MM22: identify natural areas, particularly environmentally sensitive areas and locate optional construction site. Ensure project personnel are aware of sensitive areas location and keep away.	YES	
<i>Material transport</i>	MM23: premix ready mix concrete can be adopted instead of conventional method to minimise dust, air vibration and pollution <ul style="list-style-type: none"> • ensure the loads are properly secured • ensure all loads that contain fugitive materials are covered by tarpaulins • driver training regarding speed limit and careful driving near communities 	YES	
<i>Excavation Activities: (a) In mainly flat land, (b) in steep and unstable areas (c) close to settlement</i>	MM24: strip and store top soil and later revegetate. All excessive materials disposed of in approved allocated landfills away from water sources. Spoils used to backfill quarries or waste disposal pits before they revegetated. Care taken to avoid affecting residents' livelihood.	YES	
	MM25: ground disturbance shall be phased so to limit to areas of a workable size.	YES	
	MM26: valley slopes would not be affected as location of poles has been so selected. no heavy movement of construction machinery is envisaged, special techniques will be used to minimise movements	YES	
	MM27: construction should be phased so that large areas of soil are not laid bare during wet season. .	YES	

Construction Activity	Mitigation Measure (CEMP)	Mitigation Implemented Yes/No/Partial	Defect Notice Corrective Action Required Including Deadline
	MM28: excavation dust nuisance will be minimised by selecting auger system of excavation, which is localised and limited to pole hole.	YES	
	MM29: since excavation area has been localised vegetation and top soil of surrounding area will be preserved. Trees of the corridor will only be affected and of the outside are will only be trimmed to avoid contact with live wire.	YES	
	MM30: No disruption of land contour will be envisaged and will be taken care of while selecting corridor, design of foundation and construction methodology. With localised excavation, loss to vegetation has been minimised.	YES	
	MM31: Natural drainage won't be disturbed, excavation is USP of the design, and around the foundation slope will be recreated	YES	
	MM32: surface water pollution and sedimentation will also be minimised because of localised operation	YES	
	MM33: no damage to gardens has been envisaged as one pole comes every 100m and needs only 2m*2m space. Private property outside corridor will not be affected and within corridor will have to be relocated for safety reasons. (and they will be compensated as regulations)	YES	
Dust Noise and Vibration Control	MM34: this applies to all machinery, vehicles and construction site where noise and vibration may affect susceptible receptors.	YES	
	MM35: ready mix concrete will be used to minimise impact on environment in terms of dust, noise and vibration. Ready mixed supply by Nivani. Nivani EMP will address all concerns	YES	

Construction Activity	Mitigation Measure (CEMP)	Mitigation Implemented Yes/No/Partial	Defect Notice Corrective Action Required Including Deadline
	MM36: noise at workplace will be limited to 0700hrs to 1900hrs during normal working day and won't affect residential areas. As work place is far away from residential areas.	YES	
	MM37: Vibration hazard are minimised as auger is low intensity equipment and excavator is not being used.	YES	
Construction Site Waste Management	MM38: arrange construction and camp site waste to be collected, sorted and either recycled or disposed as per local dumping laws (dump site won't be excavated below the water table and should terminate at least 1M below the natural ground level)	YES	
	MM39: no toxic or hazardous waste materials will be disposed of in dumps	YES	
	MM40: Dumping methodology adopted above will be minimised soil and water pollution.	YES	
	MM41: Aesthetics also won't be lost as area will be reclaimed	YES	
Storage and Handling of Fuel and Lubricants	MM43: first safety system exists and these fuel dumps and for our vehicles, we will have portable fire extinguisher	YES	
	MM44: to avoid such risks, we are not making any special arrangements for storage and have made long term contract with the commercial suppliers in Kimbe and Kapuira (NBPOL) who already following the norms	YES	

Construction Activity	Mitigation Measure (CEMP)	Mitigation Implemented Yes/No/Partial	Defect Notice Corrective Action Required Including Deadline
	MM45: soil contamination by fuel not envisaged as we are not using any storage dump	YES	
	MM46: no water pollution due to fuel anticipated for same very reason.	YES	
	MM47: any spills are to be cleaned up and contaminated soil removed	YES	
	MM48: Machinery operators are to be trained in safe fuel handling procedures.	YES	
Management of Hazardous Materials Explosives, Combustibles and toxic materials.	MM49: Hazardous materials shall not be stored near water surface areas.	YES	
	MM50: All used lubricants and oil shall be collected and recycled or disposed of site.	PARTIAL	Defect notice given
	MM51: Plastic sheeting shall be placed under hazardous material storage areas to collect and retain leaks and spills	YES	
	MM52: Contaminated runoff from storage areas shall be captured in ditches and ponds with oil trap at the outlet.	YES	
	MM54: All fuel drums should be contained an earthen bund which will contain the potential spillages within the bund area for later disposal in designated areas.	YES	
Increased Traffic and Operating Speeds	MM55: Vehicles operators comply with speed restrictions. On arrivals, all drivers are produced valid license. All drivers inducted into project by being check regularly their competency to handle	YES	

Construction Activity	Mitigation Measure (CEMP)	Mitigation Implemented Yes/No/Partial	Defect Notice Corrective Action Required Including Deadline
	vehicle that is allocated to them and they are aware of the speed limit.		
	MM56: traffic marshal will be there to regulate the traffic and warning signs to cautions the traffic before they approach these sites.	YES	
Site Closure	MM57: On completion of work at all work areas AIL will ensure that all waste to be removed, the site landscaped.	YES	
	MM58: when all work is complete the contractor is to remove all machinery. Vehicles and discard machinery from the site. All waste dumps, spoil dumps etc. are to be levelled	YES	
	MM59: after the project the SE is to inspect the site and confirm that it is stable and meets closure requirements	YES	

Annex 2: CEMP Compliance & Inspection Monitoring Form-DHPP

Project : Divune HPP

Implementing Agency : PNG Power Ltd

Scope of Inspection: CEMP Monitoring DHPP

Contractor : JV AGILHLHPL

Weather Condition: fine and Sunny

Attendees: Name & Position: TEIP EO, PE –Project 2Site Manager and Project HSE Officer

Date : 19th June 2017

Construction Activity	MM#	Mitigation Measure (CEMP)	Mitigation Implemented (YES /NO/PATIALLY)	Defect Notice Corrective Action Required including deadline
SITE CLEARANCE PLAN	MM1	Limit land area to be cleared for project infrastructure.	PARTIALLY	Defect Notice given Deadline for corrective action-14/07/17
	MM2	Clearly mark out each allotted segment of land for all workers including machinery operators.	YES	
	MM3	Avoid clearance of riparian vegetation unless necessary.	YES	
	MM4	Determine usage of cleared vegetation material and store in secure heaps according to disposal or re-use requirements.	YES	
	MM5	If requested, supply waste vegetation for use as fuel-wood to villagers.	YES	
	MM6	Should incineration of vegetation be unavoidable make sure it is dry so that it burns with minimal smoke.	YES	
	MM7	Prepare a site clearance map which must be endorsed by the SE.	YES	
ACCESS ROAD CONSTRUCTION	MM8	Ensure all access roads have a gravelled surface.	YES	

Construction Activity	MM#	Mitigation Measure (CEMP)	Mitigation Implemented (YES /NO/PATIALLY)	Defect Notice Corrective Action Required including deadline
	MM9	Establish a series of side drains at 2m vertical intervals (VI) where bare earth channels will be maintained to direct stormwater flows away from the road. If a 2m VI cannot be achieved, evaluate the feasibility of vegetated channels with a VI of 4m or otherwise armoured, concrete or half-round steel pipes may be used to stabilise the stormwater drainage system	NO	Defect Notice given Deadline for corrective action-14/07/17
	MM10	Provide stable outlets where cross drains are required.	NO	Defect Notice given Deadline for corrective action-14/07/17
	MM11	Ensure all pipe culverts have flared level outlets with a vertical toe wall at the end of the apron that extends about 0.35m below the apron to avoid undercutting of the apron	NO	Defect Notice given Deadline for corrective action-14/07/17
	MM12	Ensure all culverts discharge to safe, non-eroding areas.	NO	Deadline for corrective action-14/07/17
	MM13	Install sediment traps or silt curtains wherever the risk of water quality contamination in nearby water courses is high.	NO	Defect Notice given Deadline for corrective action-14/07/17
INVASIVE SPECIES PLAN	MM14	Ensure earth and other organic materials are removed from vehicles and items of heavy machinery before they are transported to the project site.	YES	

Construction Activity	MM#	Mitigation Measure (CEMP)	Mitigation Implemented (YES /NO/PATIALLY)	Defect Notice Corrective Action Required including deadline
	MM15	Set up a wash-down facility on site to clean vehicles and items of heavy machinery prior to usage in the field and before they are taken out of the project area. The wash down facility must be bunded, have an impervious surface and drain into a silt-oil-water separation unit.	YES	
	MM16	The silt from the separation unit in (ii) must be extracted periodically and spread on a sheltered bed to monitor the presence of seeds.	YES	
	MM17	Hydrocarbon material from the separation unit in (ii) must be transferred into a wastewater storage drum which should be located in the fuel bay.	NO	Defect Notice given Deadline for corrective action-14/07/17
	MM18	Ensure project employees do not remove native flora and flora from the project site.	YES	
SITE PROTECTION PLAN	MM19	The above project components and support facilities will be restricted to locations that can be effectively managed and protected.	YES	
	MM20	As far as is practicable, limit the extent of excavation in order to reduce the scope for soil erosion.	PARTIALLY	Defect Notice given Deadline for corrective action-14/07/17
	MM21	Remove topsoil and store in pre-identified stable areas for later re-use for site rehabilitation.	NO	Defect Notice given Deadline for corrective action-14/07/17

Construction Activity	MM#	Mitigation Measure (CEMP)	Mitigation Implemented (YES /NO/PATIALLY)	Defect Notice Corrective Action Required including deadline
	MM22	Separate the other excavated material as either competent (able to be used for site stabilisation or construction work) and incompetent (to be used for site restoration) materials. As in (iii) above, ensure proper storage of this material before usage	NO	Defect Notice given Deadline for corrective action-14/07/17
	MM23	Install sediment traps and silt curtains to restrict the movement of eroded particles into the local natural drainage.	NO	Defect Notice given Deadline for corrective action-14/07/17
	MM24	Ensure site excavation work is not carried out during heavy rainfall.	YES	
	MM25	Promptly stabilise excavated areas so that exposure to erosion is minimised. Appropriate site stabilisation methods include reduction of flow gradients, contouring to local drainage, placement of gravel and compaction as well as planting of local grass and other vegetation.	NO	Defect Notice given Deadline for corrective action-14/07/17
STOCK PILE AND SPOIL HEAP MANAGEMENT PLAN	MM26	Deposit excavated material outside and away from the work site where it can be either re-used in the construction process or reincorporated into the project area	PARTIALLY	Defect Notice given Deadline for corrective action-14/07/17
	MM27	Place incompetent material into appropriate locations within the project area and then re-vegetate these sites to inhibit erosion into the natural drainage.	PARTIALLY	Defect Notice given Deadline for corrective action-14/07/17

Construction Activity	MM#	Mitigation Measure (CEMP)	Mitigation Implemented (YES /NO/PATIALLY)	Defect Notice Corrective Action Required including deadline
	MM28	Structurally secure each stockpile and spoil heap storage area to avoid outward movement of the material.	NO	Defect Notice given Deadline for corrective action-14/07/17
	MM29	Install appropriate drainage and sediment containment devices.	NO	Defect Notice given Deadline for corrective action-14/07/17
PLAN FOR WORK WITHIN AND ALONGSIDE LUWINI CREEK	MM30	Prohibit stream-bank and in-stream work during high flows	YES	
	MM31	Skim and remove any visible hydrocarbon film before the decontaminated water is pumped out of the coffer dam or trench.	NO	Defect Notice given Deadline for corrective action-14/07/17
	MM32	Maintain compliance with water quality standards in Schedule 1 of the Environment (Water Quality Criteria – Aquatic Life Protection) Regulation 2002 of the Environment Act 2000, 100m downstream of the weir.	PARTIALLY	Defect Notice given Deadline for corrective action-14/07/17
NOISE AND VIBRATION MANAGEMENT PLAN	MM33	Formulate a planned maintenance schedule for vehicles, electric tools, and machinery as well as power generators and implement it as specified.	YES	
	MM34	Service vehicles, electric tools, machinery and power generators as stated in the maintenance schedule and where possible, fit noise suppression attachments.	YES	
	MM35	Carry out night time work only if unavoidable	YES	

Construction Activity	MM#	Mitigation Measure (CEMP)	Mitigation Implemented (YES /NO/PATIALLY)	Defect Notice Corrective Action Required including deadline
	MM36	Issue ear/hearing protection gear to workers where required.		
	MM37	Ensure noise level does not exceed 45dBA at the boundary of residential areas.	YES	
AIR QUALITY PLAN	MM38	Formulate a planned maintenance schedule for vehicles, heavy machinery as well as power generators and implement it as specified to prevent the generation of foul emissions.	YES	
	MM39	Use clean low sulphur fuel in vehicles, heavy machinery and power generators to avoid production of repulsive emissions.	YES	
	MM40	Any vehicle, unit of heavy machinery or power generator that continuously emits foul exhaust gases should be promptly removed from active service for repair.	YES	
	MM41	Monitor the amount of dust generated and apply suitable control measures such as traffic restriction and water spraying on roads and other exposed areas.	YES	
FUEL STORAGE AND HANDLING PLAN	MM42	Locate fuel and oil storage areas at least 20m away from a watercourse	YES	
	MM43	Where the amount of fuel to be held on site exceeds 5,000 litres, store the fuel in a sealed tank mounted on a concrete base which is bunded to hold 110% of the tank capacity and drains via an oil and water separation unit.	PARTIALLY	Defect Notice given Deadline for corrective action-14/07/17

Construction Activity	MM#	Mitigation Measure (CEMP)	Mitigation Implemented (YES /NO/PATIALLY)	Defect Notice Corrective Action Required including deadline
	MM44	Ensure that each fuel and oil storage facility or workshop is adequately sized, has a roof as well as an impervious base which is bunded and drains via an oil and water separation unit.	YES	
	MM45	Do not transfer fuel into a vehicle or unit of machinery within 20m of any watercourse	YES	
	MM46	Allow only trained personnel with appropriate PPE to handle fuel and clean up accidental spills onto land or water. Report any major spill into Luwini Creek to PMU immediately.	YES	
	MM47	Dispose of waste oil and fuel filters in a PPL sanctioned recycling, landfill or incineration facility.	NO	Defect Notice given Deadline for corrective action-14/07/17
	MM48	Transfer contaminated soil to a remediation site and rehabilitate the affected locality with fresh topsoil.	NO	Defect Notice given Deadline for corrective action-14/07/17
CONSTRUCTION MATERIAL STORAGE PLAN	MM49	Set up appropriate storage areas for the type of material including ventilation for large freight containers, provision for shelter from rain and site drainage control.	YES	
	MM50	Ensure each storage area provides adequate space for temporary placement of waste material prior to disposal as per the Waste Management Plan.	YES	

Construction Activity	MM#	Mitigation Measure (CEMP)	Mitigation Implemented (YES/NO/PATIALLY)	Defect Notice Corrective Action Required including deadline
WASTE MANAGEMENT PLAN	MM51	Liaise with PPL and CEPA on the setting up of a project dedicated landfill and/or incineration facility.	NO	Defect Notice given Deadline for corrective action-14/07/17
	MM52	Engage waste management operators and ensure they are appropriately trained and equipped with PPE.	NO	Defect Notice given Deadline for corrective action-14/07/17
	MM53	Sort out types of solid waste generated and ensure proper storage before recycling, reuse or disposal.	NO	Defect Notice given Deadline for corrective action-14/07/17
	MM54	Identify recycling or reuse options for each waste type.	PARTIALLY	Defect Notice given Deadline for corrective action-14/07/17
	MM55	Waste that cannot be recycled or reused must be either buried in the landfill area or incinerated.	PARTIALLY	Defect Notice given Deadline for corrective action-14/07/17
	MM56	Ensure nails are removed from non-treated timber off-cuts if they are to be offered to local villagers. Prohibit the supply of treated timber off-cuts to local villagers since these items may be used as firewood for cooking.	PARTIALLY	Defect Notice given Deadline for corrective action-14/07/17
	MM57	Maintain a record of all solid waste generated including waste type, quantity and mode of management, i.e., reuse, recycling or disposal method.	PARTIALLY	Defect Notice given Deadline for corrective action-14/07/17

Construction Activity	MM#	Mitigation Measure (CEMP)	Mitigation Implemented (YES /NO/PATIALLY)	Defect Notice Corrective Action Required including deadline
	MM58	Provide adequate flush toilets with hand washing sinks. Flush toilets should be connected initially to septic tanks and then underground soak-away trenches.	YES	Defect Notice given Deadline for corrective action-14/07/17
	MM59	Ensure ablution block wastewater and kitchen grey-water are also piped into septic tanks and underground soak-away trenches.	PARTIALLY	Defect Notice given Deadline for corrective action-14/07/17
	MM60	Provide for site drainage control and runoff clarification before the clarified liquid exits the construction area.	NO	Defect Notice given Deadline for corrective action-14/07/17
HAZARDOUS SUBSTANCES STORAGE AND HANDLING PLAN	MM61	Compile a list of all HAZCHEMs and their respective Material Safety Data Sheets (MSDS) and submit it to PPL for clearance.	NA	Not applicable at the moment but will be monitored in next reporting
	MM62	Display the MSDS for each approved HAZCHEM in a relevant work area.	NA	Not applicable at the moment but will be monitored in next reporting
	MM63	Train personnel in the safe use of these substances and supply appropriate PPE.	NA	Not applicable at the moment but will be monitored in next reporting
	MM64	Install an emergency eye was station and a shower in each relevant work area.	NA	Not applicable at the moment but will be monitored in next reporting
	MM65	Transport and handle each HAZCHEM as per the MSDS	NA	Not applicable at the moment but will be monitored in next reporting
	MM66	Provide a suitable waste receptacle for each HAZCHEM and ensure disposal as per the MSDS.	NA	Not applicable at the moment but will be monitored in next reporting

Construction Activity	MM#	Mitigation Measure (CEMP)	Mitigation Implemented (YES /NO/PATIALLY)	Defect Notice Corrective Action Required including deadline
WORKPLACE HEALTH AND SAFETY PLAN	MM67	Prepare a Work Statement (WS) that identifies hazards applicable to a particular site together with an outline of the approved work procedure and details of protective safety equipment to be used by any person entering the specified work area.	YES	
	MM68	As a component of the WS, formulate an emergency response plan that addresses serious accidents and nominate a response coordinator who must be contacted when an accident occurs.	YES	
	MM69	Display a copy of the WS at each relevant work site and discuss it with workers before work commences.	YES	
	MM70	Prohibit the use of drugs and alcohol on site	YES	
	MM71	Appoint from within the Joint Venture or recruit a HSO who will evaluate workplace safety issues and instruct workers on workplace hazards, health and safety issues.	YES	
	MM72	Provide workers a safe work environment and personal protective equipment (PPE) including hand, head, eye and ear protection as well as appropriate footwear.	PARTIALLY	Defect Notice given Deadline for corrective action-14/07/17
	MM73	Set up a fully resourced first-aid facility on site and engage a trained and competent health worker.	PARTIALLY	Defect Notice given Deadline for corrective action-14/07/17

Construction Activity	MM#	Mitigation Measure (CEMP)	Mitigation Implemented (YES/NO/PATIALLY)	Defect Notice Corrective Action Required including deadline
	MM74	Mitigate noise and dust generation on site.	YES	
	MM75	Provide potable water and ablution facilities for all workers.	YES	
	MM76	Record each accident, its lost production time as well as corrective action and compile the data monthly.	YES	
WORKERS CAMP AND INCOMING WORKERS PLAN	MM77	Give priority for employment to local people.	YES	
	MM78	Locate and manage camps so that social harmony is maintained between workers and local communities.	YES	
	MM79	Provide potable water, nutritional meals and recreational facilities to meet the requirements of the Employment Act 1978 or an acceptable international standard whichever is the superior.	PARTIALLY	Defect Notice given Deadline for corrective action-14/07/17
	MM80	Forbid extraction and trading in wildlife by workers to prevent the unsustainable loss of local flora and fauna.	YES	
	MM81	Prohibit workers from trespassing onto local customary land.	PARTIALLY	Defect Notice given Deadline for corrective action-14/07/17
	MM82	Dispose of waste generated from the camp as per the Waste Management Plan.	PARTIALLY	Defect Notice given Deadline for corrective action-14/07/17

Construction Activity	MM#	Mitigation Measure (CEMP)	Mitigation Implemented (YES /NO/PATIALLY)	Defect Notice Corrective Action Required including deadline
TRANSMISSION LINE INSTALLATION PLAN	MM83	Ensure the width of the transmission line easement meets conductor safety requirements in terms of sag and side clearance limits.	NA	Not applicable at the moment but will be monitored in next reporting
	MM84	Erect transmission line bearing wooden poles alongside the road within the road easement.	NA	Not applicable at the moment but will be monitored in next reporting
	MM85	Place a smooth aluminium sheet, 0.5m wide anti-climbing barrier around each pole about 3m above ground in heavily vegetated sections to prevent conductor shorting by animals such as rodents, feral cats and cuscus.	NA	Not applicable at the moment but will be monitored in next reporting
	MM86	At regular time intervals, trim and clear vegetation growth along transmission line routes.	NA	Not applicable at the moment but will be monitored in next reporting
	MM87	Offer waste vegetation to villagers as fuel-wood or otherwise burn it to clear the area.	NA	Not applicable at the moment but will be monitored in next reporting
	MM88	Wherever burning of cut vegetation matter is unavoidable ensure the material is dry enough to allow a hot clean burn.	NA	Not applicable at the moment but will be monitored in next reporting
	COMMUNITY HEALTH AND SAFETY PLAN	MM89	Carry out awareness on road safety and project site access in the local area.	PARTIALLY
MM90		Ensure all visitors report to a check-point for clearance to enter the site.	PARTIALLY	Defect Notice given Deadline for corrective action-31/07/17
MM91		Demarcate work areas with barrier tape and erect signs as required to warn people to keep away.	NO	Defect Notice given Deadline for corrective action-31/07/17

Construction Activity	MM#	Mitigation Measure (CEMP)	Mitigation Implemented (YES /NO/PATIALLY)	Defect Notice Corrective Action Required including deadline
	MM92	Routinely service each vehicle or plant machinery so that it is in a safe operating condition.	YES	
	MM93	Ensure each driver or machinery operator works in a safe and responsible manner	YES	
	MM94	Secure each load and cover loose material such as soil or sand with tarpaulin.	NO	Defect Notice given Deadline for corrective action-31/07/17
PLAN FOR HANDLING CHANCE OF DISCOVERY OF ARCHAEOLOGICAL AND CULTURAL SITES	MM95	As soon as a potential archaeological or cultural site is noticed, immediately cease work that could damage the site, cordon it off and promptly inform the work site supervisor.	PARTIALLY	Defect Notice given Deadline for corrective action-31/07/17
	MM96	Work site supervisor will notify the SEO who will examine the site and determine if further investigation by the National Museum is warranted.	NA	But will monitored closely by HSE and EO PMU
	MM97	If the outcome from (ii) is affirmative, the SEO will advise the SE and proceed with arrangements to bring officers from the National Museum to assess the site.	NA	But will monitored closely by HSE and EO PMU
	MM98	Resume work on the site after formal clearance is given by the National Museum.	NA	But will monitored closely by HSE and EO PMU
SITE REHABILITATION PLAN	MM99	Remove all waste material and contaminated soil from the site in accordance with the Waste Management Plan.	PARTIALLY	Defect Notice given Deadline for corrective action-31/07/17

Construction Activity	MM#	Mitigation Measure (CEMP)	Mitigation Implemented (YES /NO/PATIALLY)	Defect Notice Corrective Action Required including deadline
	MM100	Ensure any item that is removed from the site is neither detrimental to the environment nor a public health hazard.	PARTIALLY	Defect Notice given Deadline for corrective action-31/07/17
	MM101	Progressively landscape as well as revegetate all work areas including borrow pits and quarries so that rainfall runoff flows into the local drainage and each rehabilitated site blends into the immediate surroundings.	PARTIALLY	Defect Notice given Deadline for corrective action-31/07/17
COMMUNITY CONSULTATION AND GRIEVANCE REPORTING PLAN	MM102	Familiarise local villagers with the design and construction of the project and the implementation of this plan.	PARTIALLY	Defect Notice given Deadline for corrective action-31/07/17
	MM103	Provide regular updates on the construction process and its compliance with the CEMP.	PARTIALLY	Defect Notice given Deadline for corrective action-31/07/17
	MM104	Maintain a Complaints Register (CR) in the main project site office and record of each complaint including date, name of complainant, contact address, description of 60omplaint and name of action officer on behalf of the SE. Do not impose a fee on the complainant.	PARTIALLY	Defect Notice given Deadline for corrective action-31/07/17
	MM105	Give a copy of the register entry to the complainant after the complaint has been recorded.	PARTIALLY	Defect Notice given Deadline for corrective action-31/07/17

Attachments

(E.g. Photos, Remarks, laboratory reports etc)

Annex 3: Photos Tranche 1

Annex 3: Photos Tranche 1

1) KBTL Photos



Workers at work at what is supposed to be a workshop



Waste water piped to normal drainage system for NBPOL



Workers stringing lines



Waste from camp site 2 are being disposed of into approved landfill site operated by NBPOL



Workers eating area at Camp site 2 Kapuia



Scrap metal stored at site for later use

2) DHPP Photos

CAMP SITE /WORKSHOP AND STORAGE AREA



Workers Camp quarters



Workers morning briefing



local workers ablution block



Drainage at the back of living quarters 2



Workshop area



Camp layout



Ablution block camp 2



Office building



Mess Building



Storage containers



Mess area

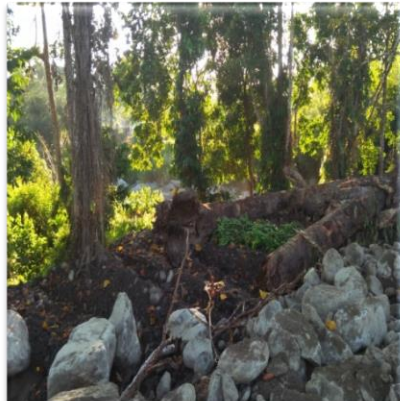


Septic tank

3) Construction Site Photos -DHPP



Diversion channel



Debris piled up near riverside



Site cleared



Penstock area



cleared site for powerhouse



Dozer grading penstock



Rocks to be blasted



Workmen working on diversion channel



PPL Officers Inspecting site

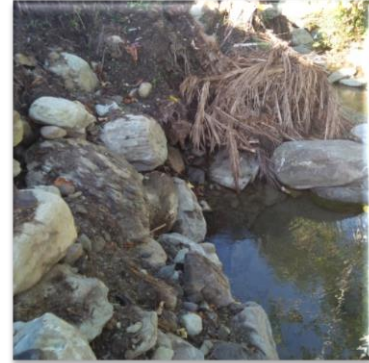
4) Batching Plant Photos - DHPP



Batching Plant



Cement Silos



Waterhole -cultural archeology



Concrete mixer



local landowner of cultural site



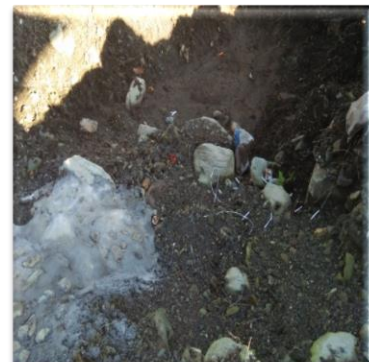
Cement batch



Access water drainage



Drainage outlet



Drainage pit

5) Crusher Plant - ILIMO



Waste metals to be removed



Conveyor



Drecher



Sediment pond



Siltation pile



Camp site

6) Consultation with the Communities Photos.

i. WAJU VILLAGE (UPSTREAM)



ii. SISIRETA VILLAGE (DOWNSTREAM)

