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July 2016

CIVIL AVIATION DEVELOPMENT INVESTMENT PROGRAM – TRANCHE 2

Period Covering

July to December 2015.

Prepared by National Airports Corporation for the Asian Development Bank.

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Environmental Monitoring Report

Loan Number: 2588/2589/2590-PNG

Reporting Period: July 2015 – December 2015 (2nd Semi-Annual)

PNG: Civil Aviation Development Investment Program – Tranche 2

Prepared by National Airports Corporation through the Government of Papua New Guinea for Asian Development Bank.

Date: July 2016

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1 INTRODUCTION

1.1 Background

1. The Government of the Independent State of Papua New Guinea (GoPNG) has requested the Asian Development Bank (ADB) to provide a Multi-Tranche Financing Facility (MFF) to facilitate investments to improve the current state of the country's domestic air transport system under the Civil Aviation Development Investment Program (CADIP).

2. The Program is a comprehensive plan to upgrade, rehabilitate and maintain 21 national domestic airports in Papua New Guinea (PNG). The executing agency (EA) for the Program is the National Airports Corporation (NAC).

3. Implementing safeguard policy is a fundamental component of ADB funded projects such as CADIP. There are three basic ADBs operational policies on safeguard: the *Environment*, *Involuntary Resettlement and Indigenous People*. All of these policies are embedded in *ADB* Safeguard Policy Statement (SPS) 2009. In addition, there is Environment Safeguard Good Practice Sourcebook Draft (2012). These safeguard policies seek to avoid, minimize or mitigate adverse environmental and social impacts, including protecting the rights of those likely to be affected by the development process. Implementing the provisions of the policies is the responsibility of the GoPNG through Project Implementation Unit (PIU) of CADIP in NAC.

4. This report covers the environmental safeguard policies and the Safeguard Policy Statement (2009), provides policies and procedures for preparation, implementation and monitoring of environmental safeguards such as; (i) environmental scoping and Initial Environmental Examination (IEE), (ii) Environmental Management Plan (EMP), (iii) Contractor' EMP Monitoring & Auditing, (iv) environmental clearances, (v) Impacts on people and natural surroundings, and also (vi) for compliance to the loan covenant for Environmental.

5. This report incorporates EMP implementation status from on-site meetings, contractors' reports, environmental audits and general environmental issues observation for the five airports in Tranche 2 identified for upgrading and rehabilitation namely Girua, Vanimo, Kundiawa, Goroka and Buka. It covers the reporting period of monitoring of these projects from July to December 2015.

6. An Environmental Assessment Resettlement Framework (EARF) documented for CADIP is part of the provisions of the environmental safeguard.

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1.2 Project Brief

7. Projects identified and works carried out by the contractor under Tranche 2 is stated in the Table 1.0.

Table 1 Component of Tranche 2 projects

No.	PROJECTS	MAIN SCOPE OF WORKS	CONTRACTOR	STATUS
1	Girua Airport Pavement Upgrading, New Terminal Building & Associated Works	Strengthening of the runway pavement to handle Q400 or similar aircraft type. Apron widening Apron widening will cater for 2 -3 Q400 parking space New terminal building to cater for increasing passenger and cargo movements	China Harbour Engineering Corporation (CHEC)	 50% completed and in progress Detail design for terminal building in progress
2	Vanimo Airport Pavement Upgrading, New Terminal Building & Associated Works	Strengthening of the runway pavement to handle F100 or similar aircraft type. Apron widening Apron widening will cater for one F100 and Q400 parking space New terminal building to cater for increasing passenger and cargo movements	Global Ltd	 30% completed and in progress Detail design for terminal building in progress
3	Kundiawa Airport Pavement Upgrading & Associated Works	Strengthening of the runway pavement to handle Dash 100 or similar aircraft type.	Shorncliffe Ltd	20% completed and in progress
4	Goroka Airport Aircraft Pavement Upgrade & Associated Works	Pavement strengthening and runway extension will allow for Fokker 100 or similar type aircrafts operations. Apron widening will cater for 2 -3 Fokker 100 parking space New terminal building to cater for increasing passenger and cargo movements	China Overseas Engineering Corporation (COVEC)	Contractor start mobilizing to site by December 2015
5	Momote and Buka Airport Fencing Installation & Associated works	Supply and installation of palisade security fencing to protect the land side for safe aircraft operations	Yet to decide	Bidding In Progress

8. Momote and Buka Airport Security Fencing & Associated Works are in the bidding stage and yet to be awarded to a contractor. Civil works for the runway pavement construction for Girua, Vanimo and Kundiawa airport is currently in progress whilst the contractor is mobilizing to move to site for Goroka Airport upgrading works.

9. The three main components of the projects are:

- (i) Improvement of a safe and secured airports and airways infrastructure
- (ii) Program Management and Capacity Development
- (iii) Project Environmental Management Plan/Program

Part of the contract is the environmental management and monitoring to ensure that 10. civil works done on construction site are environmentally friendly within the allocated time assigned to it. The key environmental impacts on natural and human environments have been assessed on-site and mitigation measures will be presented in this report.

This report also incorporates local participation and Occupational Health and 11. Safety (OHS) measures of the construction site, workers and workplace.

1.3 **Environmental Category**

Tranche 2 projects under CADIP are categorized as Environmental Category "B" 12. according to ADB's Safeguard Policy Statement (2009). Its potential environmental impacts are less adverse and site specific, few if any of them are irreversible, and can be managed. An Initial Environmental Examination (IEE) as required was carried out and documented.

13. The PNG Environmental Act 2000 and guidelines governs environment and conservation aspects in projects implementation. Within Tranche 2, projects have been classified as; (i) Level 1 for all the fencing projects and

(ii) Level 2A for the airport pavement and terminal upgrading works.

Level 1 project activities have the lowest impact on the surrounding environment. The 14. requirements for submitting an IEE was waived and acceptance was granted from Conservation & Environmental Protection Agency (CEPA) to proceed with the fencing activities without further environmental assessment.

15. Level 2A is anticipated to cause potential adverse environmental impacts which are site- specific, few are if any of them are irreversible, and mitigation measures can be designed readily. This level involves earthworks, water abstraction, guarrying and waste discharge while doing upgrading & construction.

1.4 **Environmental Performance Indicators**

16. For qualitative and quantitative measurement of air and noise quality, general observation was carried out to determine compliance with the EMPs.

1.5 Institutional Arrangement for Project Environmental Management

17. NAC is responsible for managing the construction contract including monitoring and the implementation of the contractors EMP.

18. An International Environmental Specialist (IES) shall be engaged intermittently as and when required to assist with:

- (i) Strengthening the environmental management of the project during detailed design, bidding process, contract process, construction, and implementation,
- (ii) Supervision and guidance of the environmental assessment process for all subprojects under the MFF,
- (iii) Supervision of the EMP implementation of subprojects, and
- (iv) Undertaking the necessary institutional strengthening including on-the-iob training for the PE of NAC by giving major tasks to the PE in all of these activities.

The Project Environmentalist (PE) of PIU is responsible for monitoring the 19. contractors' implementation of the EMP and to coordinate EMP implementation of the project.

20. A contractor's representative to implement the CEMP on-site is stationed at the contactors site office. The contractor reports to the Engineers Representative (ER) and the PE of PIU.

2 MONITORING ACTIVITIES

2.1 Methodologies

21. Environmental monitoring is carried out by the contractor, PIU Project Engineer; the Site Supervisor with the assistance from the PE. Environmental audits are carried out on a quarterly basis by the PE. 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 The Engineer and/or the ER of the Contract.

22. A project specific environmental monitoring checklist has been prepared by the contractor with inputs from the PE. The checklist is used for daily/monthly monitoring as well as the audits which is carried out on a quarterly basis. The monitoring checklist for this quarter for all Tranche 2 projects is summarized in Annex A.

23. It was emphasized during construction site meetings that monitoring is an integral part of the EMP implementation and must be reflected adequately in their monthly environmental monitoring report as well. EMP implementation monitoring for ongoing project in Tranche 2 is presented in Annex B, C and D.

24. Site inspection and monitoring was carried out at the following areas:

- Contractors' site establishment & lay down area,
- Drainage works and Grave/water extraction area,
- Pavement works and building areas,
- Batching plant area,
- Workers compound,
- OHS for permanent workers,
- Nearby communities/settlements consultation, and
- Local participation

25. The contractors' environmental representative ensures all mitigating measures contained herein and thereafter is adhered to including necessary instructions from the Engineer whenever environmental impacts are observed and corrected.

3 WORKS IN PROGRESS

26. Tranche 2 projects works in progress during the period July to December 2015 (2nd semiannual) is summarized in Table 2.

Table 2 Summary of the Progress of on-going Tranche 2 projects

Girua Airport Pavement Upgrading, New Terminal Building & Associated Works

Pavement Works

More stripping of the flight strip and topsoil stockpiling towards the taxiway and apron area.

Continuation of external works to include drainage, sewerage, and storm water, domestic and fire water piping. Excavation and removal of top soil at the air side area was done, backfilling and compaction is still progressing along the runway.

Stripping of top soil has been completed and carted away to designated disposal areas. Vee drains have been dug connecting to the existing main storm water drainage system to drain away surface runoff. Placing of 110mm diameter perforated pipes wrapped in Geotextile and lay on low wet areas under the Apron to drain away subsoil water build-up. New 900 dia. Twin pipe culvert 56m long have been laid connecting to the existing open line storm water drainage with inlet and outlet concrete headwalls. About 6m corridor clearance of topsoil along the perimeter fenceline. Excavate to a design depth for fence embankment. Install palisade fence. Grading of all flank areas to specified grades and supplying and placing of Topsoil and Grass.

Excavation to required depth on the runway pavement. Backfill with select basecourse/fill material and compact to achieve designed slope and thickness. Priming and laying of bitumen and compact. All works in stages along the runway.

Fencing works completed

Vanimo Airport Pavement Upgrading, New Terminal Building & Associated Works

Pavement works

Contractors' mobilizing to site and establishment completed Striping of the flight strip and topsoil stockpiling commenced

External works to include drainage, sewerage, and storm water, domestic and fire water piping. Excavation and removal of top soil at the air side area was done, backfilling and compaction is progressing along the runway. Extraction of gravel, crushing, barging to site from Wewak and stockpiling. Improvement of the access road to the extraction site of coronus base course materials.

Excavation to required depth on the runway pavement. Backfill with select base course/fill material and compact to achieve designed slope and thickness. Priming and laying of bitumen and compact. All works in stages along the runway.

Fencing works

About 6m corridor clearance of topsoil along the perimeter fenceline. Excavate to a design depth for fence embankment. Install palisade fence and reinforce the embankment with concrete. Grading of all flank areas to specified grades and supplying and placing of Topsoil and Grass. Spoils used as flanks for re-grassing

Kundiawa Airport Pavement Upgrading & Associated Works

Pavement works

External works to include drainage, sewerage, and storm water, domestic and fire water piping. Excavation and removal of top soil at the air side area was done, backfilling and compaction is progressing along the runway. Extraction of gravel, crushing and stockpiling

Fencing works

About 6m corridor clearance of topsoil along the perimeter fenceline. Excavate to a design depth for fence embankment. Install palisade fence. Grading of all flank areas to specified grades and supplying and placing of Topsoil and Grass.

Goroka Airport Aircraft Pavement Upgrade & Associated Works

Mobilization

Contractors' mobilizing to site and establishment completed

Mobilization of materials, equipment, machineries and personnel to site in December 2015. Confirming the location of river gravel extraction at Kamaliki River. Allocation and initial clearing of site establishment area within state land.

Crushing and stockpiling of gravel shall be done on-site inside aerodrome land. Set-up of crusher & batch plant.

Momote and Buka Airport Fencing Installation & Associated works

Works are yet to commence.

4. COMPLIANCE WITH ADBS AND NATIONAL ENVIRONMENTAL REQUIREMENTS

27. Compliance status with national / state / local statutory environmental regulatory requirements is shown in Table 3.0. Table 3 Compliance Status for Tranche 2 Projects

NO.	PROJECT	STATUTORY ENVIRONMENTAL REQUIREMENTS	STATUS OF COMPLIANCE	ACTION REQUIRED
1	Girua Airport Pavement Upgrading, New Terminal Building & Associated Works	Environmental Clearance under the 'Notification of preparatory Works' Documentation and approval of contactors Site specific EMP EMP Implementation and Monitoring Construction EMP progress auditing and reporting	Completed and no further action (NFA) Completed Yes (done by contractor on monthly basis) Yes (done by PIU PE on quarterly basis)	NFA
2	Vanimo Airport Pavement Upgrading, New Terminal Building & Associated Works	Environmental Clearance under the 'Notification of preparatory Works' Documentation and approval of contactors Site specific EMP EMP Implementation and Monitoring Construction EMP progress auditing and reporting	Completed and no further action (NFA) Completed Yes (done by contractor on monthly basis) Yes (done by PIU PE on quarterly basis)	NFA
3	Kundiawa Airport Pavement Upgrading & Associated Works	Environmental Clearance under the 'Notification of preparatory Works' Documentation and approval of contactors Site specific EMP EMP Implementation and Monitoring Construction EMP progress auditing and reporting	Completed and no further action (NFA) Completed Yes (done by contractor on monthly basis) Yes (done by PIU PE on quarterly basis)	NFA
4	Goroka Airport Aircraft Pavement Upgrade & Associated Works	Environmental Clearance under the 'Notification of preparatory Works' Documentation and approval of contactors Site specific EMP EMP Implementation and Monitoring Construction EMP progress auditing and reporting	Completed and no further action (NFA) Completed Yes (to be done by contractor on monthly basis) Yes (to be done by PIU PE on quarterly basis)	NFA
5	Momote and Buka Airport Fencing Installation & Associated works	Documentation and approval of contactors Site specific EMP EMP Implementation and Monitoring Construction EMP progress auditing and reporting Consent for vegetation / food gardens / crops / assets clearance	Not yet. Contract not award Not yet. Contract not award Not yet. Contract not award In progress	Consent through an MOU or records of minute of meetings with food crop owners and locals

5. COMPLIANCE STATUS WITH THE ENVIRONMENTAL COVENANTS

28. The status of compliance with the environment covenants in the loan agreement is presented in Table 4. Table 4 Compliance Status for Tranche 2 Projects Environmental Covenants

REFERENCE	COVENANTS	COMPLIANCE
Loan agreement (special Operations) – CADIP Article 1: Loan Regulations; Definitions Section 1.02.	 Wherever used in this Loan Agreement, the several terms defined in the Loan Regulations have the respective meanings therein set forth unless modified herein or the context otherwise requires. Additional terms used in this Loan Agreement have the following meanings: (d) "Environmental Assessment and Review Framework" or "EARF" means the environmental assessment and review framework for the Investment Program, including any update thereto, agreed between the Borrower and ADB and incorporated by reference in the Framework Financing Agreement (FFA); (e) "Environmental Management Plan" or "EMP" means an environmental management plan for the Project, including any update thereto, incorporated in the IEE; (f) "Environmental Safeguards" means the principles and requirements set for in Chapter V, Appendix 1, and Appendix 4 (as applicable) of the SPS; (n) "Initial Environmental Examination" or "IEE"" means an initial environmental examination for the Project, including any update thereto, prepared and submitted by the Borrower pursuant to the requirements set forth in the EARF and cleared by ADB; (cc)"Safeguard Policy Statement" or "SPS" means ADB's Safeguard Policy Statement (2009); (dd) "Safeguards Monitoring Report" means each report prepared and submitted by the Borrower to ADB that describes progress with implementation of, and compliance with the EMP, the RP and the IPP (as applicable), including any corrective and preventative actions. 	Complying
Loan agreement (special Operations) – CADIP SCHEDULE 4 Procurement of Goods, Works and Consulting Services	 <u>Conditions for Award of Contract</u> 7. The Borrower and NAC shall not award any Works contract which involves environmental impacts until NAC has: (a) Obtained the final approval of the IEE from the appropriate environmental authority of the Borrower; and (b) Incorporated the relevant provisions from the EMP into the Works contract. 	Complying

Loan agreement (special Operations) – CADIP SCHEDULE 5 Execution of Project; Financial Matters	Environment 7. The Borrower shall ensure, or cause NAC to ensure, that the preparation, design, construction, implementation, operation and decommissioning of each Subproject and all Project facilities comply with: (a) all applicable laws and regulations of Borrower relating to environment, health and safety; (b) the Environmental Safeguards; (c) the EARF; and (d) all measures and requirements set forth in the IEEs, the EMP, and any corrective or preventative actions set forth in a Safeguards Monitoring Report. <u>Safeguards – Related Provisions in Bidding Documents and Works</u> <u>Contracts</u> 12. The Borrower shall ensure, or cause NAC to ensure, that all bidding documents and contracts for Works contain provisions that require	Complying
	 contractors to: (a) comply with the measures relevant to the contractor set forth in the IEEs, the EMP, and any corrective or preventative actions set forth in a Safeguards Monitoring Report; (b) make available a budget for all such environmental and social measures; 	Complying Complied and budget made available/allocated in the contract agreements
	(c) provide the Borrower and NAC with a written notice of any unanticipated environmental impacts that arise during construction, implementation or operation of the Project that were not considered in the IEEs, the EMP;	Complied
	(d)adequately record the condition of roads, agricultural land and other airport infrastructure prior to starting to transport materials and construction; and	Existing road conditions range from fair to good. Most roads are usable / accessible. Conditions of agricultural land and infrastructures are recorded through photos and videos.
	 (e)reinstate pathways, other local infrastructure, and agricultural land to at least their pre-project condition upon the completion of construction. <u>Safeguards Monitoring and Reporting</u> 13. The Borrower shall do the following or cause NAC to do the following: 	Complied with in line with construction site restoration / revegetation plan to be executed by the contractor.
	(a) submit semi-annual Safeguards Monitoring Reports to ADB and disclose relevant information from such reports to affected persons promptly upon submission ;	Complied and needs improvement to submit subsequent reports on time.

(b) if any unanticipated environmental risks and impacts arise during construction, implementation or operation of the Project that were not considered in the IEEs, the EMP, promptly inform ADB of the occurrence of such risks or impacts, with detailed description of the event and proposed corrective action plan; and	Not applicable at this stage. ADB will be informed of the risks and impacts with the proposed corrective action.
(c) report any actual or potential breach of compliance with the measures and requirements set forth in the EMP, or any RP promptly after becoming aware of the breach.	Contractors' monthly monitoring report has not been submitted to NAC on time.
Health 17. The Borrower shall ensure, or cause NAC to ensure, that the contractor will disseminate information on the risk of transmission of sexually- transmitted diseases, including HIV/AIDS, in health and safety programs to all construction workers employed under the Project. Specific provisions to this effect shall be included in bidding documents and Works contracts, and compliance shall be monitored by NAC and reported to ADB.	Complied and forms part of the EMP in the contract

6. COMPLIANCE STATUS WITH EMP AS STIPULATED IN AGREEMENT WITH ADB

29. The compliance with environmental management and monitoring plan is stated in Table 5. **Table 5. Project Compliance with ADB Environment Requirement**

NO.	PROJECT	EMP PART OF CONTRACT DOCUMENT	EMP BEING IMPLEMENTED	STATUS OF EMP IMPLEMENTATION	MITIGATION MEASURE
		(Yes/No)	(Yes/No)	(Excellent/Satisfactory/Partially Satisfactory/Below Satisfaction)	
1	Girua Airport Pavement Upgrading, New Terminal Building & Associated Works	Yes	Yes	Partially satisfactory	Needs improvement on Occupation Health and Safety
2	Vanimo Airport Pavement Upgrading, New Terminal Building & Associated Works	Yes	Yes	Satisfactory	Needs improvement on Occupation Health and Safety
					Stockpiling of earthworks should be away from drains
3	Kundiawa Airport Pavement Upgrading & Associated Works	Yes	Yes	Partially Satisfactory	Needs improvement on Occupation Health and Safety
					Sedimentation and surface runoffs control needs to be in place on the drains
4	Goroka Airport Aircraft Pavement Upgrade & Associated Works	Yes	Initial stage (drafting & reviewing of contractors EMP	Satisfactory	Needs further amendments to the EMP before acceptance
5	Momote and Buka Airport Fencing Installation & Associated works	Yes	Not yet. Contract not award	Not yet. Contract not award	

7. MONITORING RESULTS AND ACTIONS REQUIRED

30. EMP monitoring for Tranche 2 projects was based on the main areas of concern summarized in table 6.0 below. Main EMP concerns and mitigation measures applied during this period (July to December 2015) is shown in table 7.0 below. For Buka and Momote airport fencing projects, EMP monitoring will start from site establishment.

Table 6 Summary of the main areas of EMP monitoring undertaken during July – December 2015

	PROJECTS				
	Girua Airport Pavement Upgrading, New Terminal Building & Associated Works	Vanimo Airport Pavement Upgrading, New Terminal Building & Associated Works	Kundiawa Airport Pavement Upgrading & Associated Works	Goroka Airport Aircraft Pavement Upgrade, New Terminal Building & Associated Works	Momote and Buka Airport Fencing Installation & Associated works
Batching Plant Area	NA (Terminal Building works that will require more concrete is yet to commence)	NA (Terminal Building works that will require more concrete is yet to commence)	NA	NA (Works yet to commence)	NA (Works yet to commence)
Crusher Plan Area	 Continued production of back filling materials and aggregate at the contractors' crusher plant at Girua River. Stockpiling of more river Gravel and aggregates inside the crusher compound vicinity. Maintaining of crusher plant. Ensure stability of the river sides free of excess sedimentation discharge. Proper maintenance of all machines on site. Controlling of water extraction for cleaning the gravels from the nearby river. Sedimentation 	 Continued production of back filling materials and aggregate at the contractors' crusher plant in Wewak and barged to Vanimo. Stockpiling of more coronus basecourse materials and aggregates inside compound vicinity. New construction workers have proper PPEs. Needs improvement to ensure all workers are supplied with proper PPEs. 	 Continued production of crushed gravels for aggregate production for the entire project. Stockpiling of more crushed river gravel and aggregates produced. The river sides are kept clean and free of excess sedimentation discharge. Routine maintenance to all machines on site to ensure there is no leakage and exhaust emission conforms to EMP standards. Controlling sediment build up in the pond next to the river for sourcing the water supply for cleaning the gravels. 	NA (Works yet to commence)	NA (Works yet to commence)
	 discharge is settled and/or controlled in a sedimentation pond before being discharged. Regular maintenance & fine tuning of the plant is maintained on-site in case of machine malfunction or breakdown and nose nuisance control to nearby 		 Regular maintenance & fine tuning of the plant is maintained on-site in case of machine malfunction or breakdown. Ensure all construction workers have proper PPEs. 		

communities.

Camp Site Area

- Ensure all construction workers have proper PPEs.
- Hygiene and cleanliness is maintained at a satisfactory level. Practice of maintaining a clean campsite is emphasized as part of the company's practice.
- CHEC Environmental representative conducts routine campsite inspections to ensure proper health and hygiene habits are practiced at the living guarters and reports on any issues that need attention from management.
- Workshops and work places are kept clean and tidy. All construction and salvage materials are properly stored in designated areas and removed to designated disposal areas.
- Most of the construction workers have proper PPEs.

- Basic housekeeping is maintained to a much better standard to ensure that a clean and healthy environment is maintained in the site office complex, contractors' personnel shelters, toilet, shower and Kitchen areas.
- Kitchen wastes are disposed in rubbish bins.
- All construction and salvage materials are stored in designates areas.
- Workshops and work places are kept clean and tidy. All wastes are properly stored in designated areas and removed to designated disposal areas.
- Most of the construction workers have proper PPEs.

- Hygiene and cleanliness is maintained at a satisfactory level at the workers campsite. Practice of maintaining a clean campsite is emphasized as part of the company's policy.
- Kitchen wastes are separated into biodegradable and nonbiodegradable bins and disposed off to public rubbish dump.
- All construction materials are stored away in designates areas but needed to be properly and orderly arranged and stored.
- Workshops and work places are kept clean and tidy. Oil spillage and proper storage of petrochemical products is emphasized. Any minor spillage must be cleaned immediately.
- Most of the construction workers have proper PPEs.

- Contactor mobilizes to site and set up the camp.
- EMP for civil works in setting up the camp facilities is applied.

NA

(Works yet to

commence)

- Proper waste management system in place.
- All PPEs, occupation health & safety policy /practice, and Environmental, Policy to be in place

Site	 Maintain compliance to EMP on the main runway pavement 	 Maintain compliance to EMP on the main runway 	 Maintain compliance to EMP on the main runway pavement upgrading 	NA
tion	upgrading and associated works	pavement upgrading and associated works	and associated works	(Works yet to
nct	- Maintain compliance to company	-	- All construction activities on site are	commence)
str	Rules and Regulations, Company	 Maintain compliance to 	strictly monitored to ensure the	
uo	Policy on Health and Safety at	company Rules and	objectives of EMP are achieved.	
C	Workplace	Regulations, Company		
		Policy on Health and	 Maintain compliance to company 	
	 Maintaining the dimension of the 	Safety at Workplace	Rules and Regulations, Company	
	drains construction to drain		Policy on Health and Safety at	
	runway surface runoffs	 PPEs were provided but 	Workplace	
		few new workers will		

	 Ensure that stripping of grass and top soil on the flight strip with controlled mitigation measures on dust, sedimentation and stockpiling. Stripping of topsoil and disposed in designated areas away from water course Most of the construction workers have proper PPEs. 	 require new PPEs supplies Maintaining the dimension of the drains construction to drain runway surface runoffs Further stripping of grass and top soil on the flight strip with controlled mitigation measures on dust, sedimentation and stockpiling. Spoils stockpiles disposed in designated areas away from water course. 	 Maintaining the dimension of the drains construction to drain runway surface runoffs Further stripping of grass and top soil on the flight strip with controlled mitigation measures on dust, sedimentation and stockpiling. Spoils stockpiles disposed in designated areas away from water course. Most of the construction workers have proper PPEs 		
Weather Impact on Project Progress	- The overall weather pattern was rainy is the first quarter to considerably fine with frequent showers and cloud cover towards the mid of the year.	 It was generally rainy in the beginning of the year and sunny towards the mid of the year with frequent showers. 	- Overall weather pattern for this quarter was fine and dry	- The overall weather pattern has been generally fair in the morning and cloudy to rain in the afternoon t. Usually rain at night time was observed	NA (Works yet to commence)
Water Source (Ground/Surface)	 Contractor is using ground water bore system for drinking, cooking, toilet supplies and washing clothes. It's a self-treatment water bore. Water for dust control and use in civil works in construction is sourced from nearby Girua River. 	 Contractor is using water from the town water supply by connecting to the main supply. The water is used for drinking, cooking, toilet supplies and washing clothes. Water for dust control and use in civil works in construction is sourced from nearby rivers. 	 Contractor is using water from the town water supply by connecting to the main supply. The water is used for drinking, cooking, toilet supplies and washing clothes. Water for dust control and use in civil works in construction is sourced from nearby Simbu River. 	NA (Works yet to commence)	NA (Works yet to commence)

	MITIGATION MEASURES	Corrected (✓ / X)	Remarks
able 7. Summary of EMI	P implementation by the contractors after quarterly audits		
Spoils	 Stockpiling away from drains and water bodies Levelling of low areas within the airport. 	~	
Occupational Health & Safety	 Ensure proper provisions of PPEs to construction workers Provision of wash-down area for trucks, cars Provision of detergents and soap at washing area Provision of good drinking water to workers Installation of Safety Signage at appropriate areas 	~	Need to maintain supply PPEs to construction workers
Spillage of petroleum	 Ensure spill kits are readily available on site and use to contain Vanimo, Airport Payement Upgrading, New Terminal Building & 	Associated W	lorks
toxic materials on water (surface/ground) or ground	 Proper and well maintained storage area for petroleum products, hazardous and toxic materials storage area. Fill and compact sand around the refueling truck at the contractors' site. 		
Local Participation	 Sourcing of labourers from locals must be maintained. Involvement of women or women groups must be considered. 	~	Main the employment of 7 local women (3 in kitchen works and 4 in office admin.)
Spoils	 Used for landfilling and/or proper disposal Stockpiling away from drains and water bodies Levelling of low areas within the airport. 	~	
Occupational Health & Safety	 Provision of proper provisions of PPEs to construction workers Provision of wash-down area for trucks, cars 	~	 Partly done. Still need more improvement esp. to supply PPE to additional local labourers
Spillage of petroleum products, hazardous and toxic materials on water (surface/ground) or	 Ensure spill kits are readily available on site and use to contain spillage. Proper and well maintained storage area for petroleum products, Kundiawa Airport Pavement Upgrading & Associated Works 	~	
ground	 Hazardous and toxic materials storage area. Construct concrete pad around vehicle maintenance and workshop 		
Local Participation	 Sourcing of labourers from locals must be maintained. Involvement of women or women groups must be considered. 	~	 Employed 3 local woman to do laundries, general cleaning of office, kitchen and assist in cooking. Plan to include a woman as contractors' office admin assistance next year 2016.
Spoils	 Used for landfilling and/or proper disposal Stockpiling away from drains and water bodies Levelling of low areas within the airport. Correct disposal of excess spoils at public dump site or given to communities for their use. 	✓	

Spillage of petroleum products, hazardous and toxic materials on water (surface/ground) or ground	 Ensure spill kits are readily available on site and use to contain spillage. Proper and well maintained storage area for petroleum products, hazardous and toxic materials storage area. Used oil must be stored in sealed containers Supply rages to wipe out/clean small amount of oil spills immediately. 	~	
Occupational Health & Safety	 Maintain proper provisions of PPEs to construction workers Provision of wash-down area for trucks, cars 	~	Need to maintain supply PPEs to construction workers
Dust control	 Use water trucks to sprinkle exposed soil areas to control dust pollution to the nearby surrounding communities, houses, roads and buildings. 	√	
Local Participation	 Sourcing of labourers from locals must be maintained. Involvement of women or women groups must be considered. 	~	About 8 local women from the 20 member groups were involved as general labour in the installation of the airport fence.

31. EMP Implementation and mitigation measures on Tranche 2 projects construction site were satisfactory. Quite an improvement from the 1^{st} half of the year (January – June 2015 Report). Again there were no reports of major environmental impacts. Improvements noted in the 2^{nd} quarter of 2015 audit were partially undertaken by the contractors. More emphasis and strategic approach to monitor contractors' performance in EMP implementation will be applied to ensure corrective actions are implemented accordingly and on time.

32. Provision of proper PPE needs to be improved and maintained all throughout the duration of the contract. There was an emphasis on HIV/AIDS Awareness to construction workers and nearby communities. So far, eighteen (18) local women were employed to work in areas of responsibilities within their capacity. No major casualties or incidences were reported on site apart from some minor First Aid Cases.

33. Disposal of domestic waste from contractors' site is managed through the normal town disposal facilities. Littering and waste petrochemical products such as lubricants, chemicals, asphalts and fuel (diesel/petrol) were stored in sealed drums/containers.

7.1 Environmental Quality Monitoring Results

34. Dust is minimized using the water truck during dusty days.

35. The contractor is advised to carry out water quality once every quarter or semiannually. Water quality is done mainly on discharge areas into nearby waterbodies and also from groundwater.

36. Measurement for the air and noise quality cannot be done since no monitoring equipment are available on-site to quantify the required data. However, machines/plants/equipment and trucks used for construction works are regularly serviced and undergo complete service upon required mileage. This ensures emissions generated from the engines are minimized or controlled at low acceptable levels.

8. SUMMARY AND CONCLUSIONS

37. Generally works on all sites – campsite, construction site, crusher site and batch plant site have improved and complied with the implementation of the inspection items checklist as per the approved EMP/CEMP.

38. There is periodic implementation of the Occupational Health and Safety awareness not only to the construction workers but also to surrounding communities and public at large. This also includes HIV/AIDs awareness.

39. Local women were engaged to work in areas appropriate for them under the project.

40. Another audit will be done on the Contractor's Environmental Compliance performance in the first quarter of next year 2016.

41. For this 2015 year ending of environmental monitoring, all projects in Tranche 2 have not indicated any significant or major environmental impacts.

ANNEX A: MONITORING EM CHECKLIST FOR TRANCHE 2 PROJECTS

Item/Impact	Action/Mitigation	Mitigatio Impleme	n ntation	Impacts Observed/Location	Action Required (incl. by date)	Contractor Response/Comment
	ineasule	Yes/No	Effectiveness (1 to 5)			
Contractor environmental awareness	 Aware of mitigation measures; Delivering training and/or awareness to staff 	Yes	4	Batching Plant Crusher Plant Campsite	No action required	No comment
EMP Implementation	 Strict implementation is to be done The designated officers functions and responsibilities to be carried out 	Yes	4	All sites of the project	No action required	No comment
Maintenance Works and Construction Methods	 On-going project sites has been properly implemented 	Yes	4	All sites of the project	No action required	No comment
Site Conditions	 Local community is sues on lands and employment were properly addressed and resolved. 	Yes	4	Vanimo and Kundiawa still need to employ women	Done	To monitor
Environment Management Measures	- Environmental issues as tabulated in the EMP will be properly implemented and mitigated as to the probable impact.	Yes	4	All sites of the project	Environmentalist and Project engineer to spearhead the implementation	To monitor

Effectiveness rating; 1 = non-compliant - corrective actions required; 2 = partial compliance – corrective or alternative actions required; 3 = adequately implementing CEMP measures; 4 = more than adequately implementing CEMP measures; 5 = excellent compliance, incl. measures in addition to CEMP

ANNEX B: EMP IMPLEMENTATION – GIRUA AIRPORT

UPGRAIDNGECT NAME:	GIRUA AIRPORT PAVEMENT UPGRADING, NEW TERMINAL BUILDING & ASSOCIATED WORKS	CONTRACT NO:			Prov	INCE:	ORO PROVINCE
Date of Inspection:	December 2015	Inspected By (And De	esignation):	Barksy (PIU)	Initial		BP
Remarks:	Satisfactory	Witnessed By (And D	esignation):	Project Engineer(s)	Initial:		MA
	,		5 ,	Contractor (CHEC)	Initial:		
ENVIRONMENTAL ISSUE	MITIGATION MEASURES		LOCATIONS	TIMEFRAME	COMF	PLIED	REMARKS
					YES	NO	
SOIL EROSION	1		1	I			ſ
Slope erosion and sedimentation of nearby water bodies	 Installation of silt traps on a Minimize clearing of vegeta are exposed Establish requisite tempora structures Undertake immediate re-ve of construction works 	all drains ation and time surfaces ary/permanent control egetation after completion	Airport vicinitie	es Construction Phase	√		 Sedimentation controls maintained Contractor is aware of preparing a Re-vegetation Plan Local women will be involved in the re-vegetation plan.
Sediment runoff which coul damage aquatic and marin ecology or flooding issues	 Locate stockpiles in control Sub-grade and sub-base r after removal of topsoil Planned construction work Removal of spoils and control 	olled areas material placed quickly c during dry season Istruction debris	Downstream of Airport sites a waterways	of nd Construction Phase	•		 No works during rainy season
WATER QUALITY/QUANTITY							
Disruption of Surface and Ground Water	 Dimension of drains Diversion of stream Use of grassed areas for r Location of stockpiles on p Removal of stockpiles after Re-vegetation after construction 	unoff oaved areas er construction uction	Airport and surrounding areas and Downstream from construction areas	Duration of project	~		- Maintain drainage system
Contamination of nearby water bodies by toxic and hazardous substances	 Installation of oil and traps Development of safe stora handling of hazardous and Proper disposition of haza materials 	in drains ge areas and proper toxic materials rdous and toxic	Airport and surrounding areas	Duration of project	~		
Pollution from domestic sewage and wastes	 Proper solid waste manag practiced in work areas Installation of sanitation ar camps, offices and ancillar 	ement system to be nd treatment facilities in ry facilities	Airport, Camp Offices and Ancillary Facilities	s, Duration of project	✓		

ENVIRONMENTAL ISSUE	MITIGATION MEASURES		TIMEFRAME	COMPLIED		REMARKS
ENVIRONMENTAL 1550E		LOCATIONS	HWEFRAWE	YES	NO	REWARNS
Contamination from oil and grease	 Collect and recycle petroleum products Development of spill contingency plans Construction of bund walls and drainage systems around fuel storage areas 	Ancillary Facilities	Duration of project	~		- Maintain the bund around refuel area.
AIR POLLUTION						
Increase in levels of Total Suspended Particulates (TSP), SO2 and NO2	 Locate Ancillary Facilities away from residential and settlement areas Provide workers with Personal Protective Equipment (PPE) Proper maintenance of vehicles, machineries and equipment 	Airport site and adjacent villages and settlements	Pre-Construction and Construction Phase	~		- Maintain vehicles and machineries.
Health hazards and nuisances to nearby villages and settlements	 Regular monitoring of air quality in the vicinity of the airports and sensitive receptors 	Airport site and adjacent villages and settlements	Operation Phase	✓		- Require environmental monitoring equipment to quantify. However, visual assessment indicated fewer nuisances tolerable to nearby settlement.
NOISE POLLUTION						
Health risks to workers and residents of nearby villages and communities	 Control vehicles speed in work areas and sensitive locations Locate Ancillary Facilities away from residential and settlement areas Provide workers with Personal Protective Equipment (PPE) Proper maintenance of vehicles, machineries and equipment 	All construction areas, access routes, and quarry sites	Pre-Construction and Construction Phase	~		 Need improvement on provisions of PPEs Generators located away from nearby residences, village and communities. Proper and routine maintenance of machines and vehicles are done
Nuisance to residents of nearby villages and communities	 Establishment of buffers between airport and nearby settlement areas Preparation of operational procedures by Airport Operator based on ANZECC 1992 or Australian Noise Exposure Forecast (ANEF) 	Nearby settlements	Operation Phase	~		Limit use of vehicles, machines, Crusher plant is done only during day time
OCCUPATIONAL HEALTH AND S	AFETY					
Hazards to worker's health and safety	 Construction methodology under control of Safety Officer and CSC Approved Contractor's Occupational Health and Safety Plan 	Airport sites	Pre-Construction and Construction Phase	~		- OHS plan submitted and accepted
Spread of HIV and other communicable diseases	 Contractor to source labourers and workers from the nearby villages Contractors to increase awareness of workers 	Airport site and adjacent villages and settlements	Pre-Construction and Construction Phase	~		- HIV/AIDS awareness to include nearby communities.
SOCIAL /COMMUNITY CONCERN	S					
Changes in nearby land values	Proper valuation of land	Surrounding areas and nearby villages	Operation phase	~		- Not required

			TIMEEDAME	COM	PLIED	DEMARKS
ENVIRONMENTAL 1550E	MITIGATION MEASURES	LOCATIONS	TIMEFRAME	YES	NO	REMARING
Loss of aesthetics	Landscaping and re-vegetation	Vicinity of Airports	Duration of Project	~		
Cultural differences risk/social conflicts	Contractor to source labourers and workers from the nearby villages	Airport site and adjacent villages and settlements	Pre-Construction and Construction Phase	~		- Well implemented
Slum creation risks	Demolition of structures as part of abandonment plan	Airport sites	Completion of Construction	~		 Not applicable (NA) at this construction stage
Disruption of utilities	Investigate limits to required services and minimize disruptions	Nearby settlements	Pre-Construction and Construction Phase	~		 No disruption to utilities. Contactors are made aware of the public utilities
Increase in traffic	Prepare traffic management plans	Airport vicinities and major roads into the Airports	Duration of Project	 Image: A start of the start of		 Movement of cars/machinery into airside aided by NAC Safety Officer Landside traffic is on normal road networks accept when needed guidance from NAC Safety Officer.
SITE ABANDONMENT						
Decommissioning of work sites	 Preparation of abandonment plan Return of all transient workers to original places of residences Demolition of temporary offices and contractor's depot area Dismantling of ancillary facilities Re-vegetation of exposed areas Proper disposition of construction debris 	Construction and camp sites	After completion of construction	✓ 		 NA at this construction stage. Contractor is required to prepare a Site Abandonment Plan

ANNEX C: EMP IMPLEMENTATION – VANIMO AIRPORT UPGRADING WORK

PROJECT NAME:	VANIMO AIRPORT PAVEMENT UPGRADING, NEW TERMINAL BUILDING & ASSOCIATED WORK	Contract No:		PROVINCE:	SANDAUN PROVINCE
Date of Inspection:	December 2015	Inspected By (And Designation):	Barksy (PIU)	Initial:	BP
Pomarka:	Satisfactory	Witnessed By (And Designation):	Project Engineer(s)	Initial:	MT
			Contractors' Environmental Rep.	Initial	

	MITIGATION MEASURES		TIMFFRAME	COMPLIED		DEMARKS		
ENVIRONMENTAL 1550E		LOCATIONS	TIMEFRAME	YES	NO	REMARNS		
Soil Erosion								
Slope erosion and sedimentation of nearby water bodies	 Installation of silt traps on all drains Minimize clearing of vegetation and time surfaces are exposed Establish requisite temporary/permanent control structures Undertake immediate re-vegetation after completion of construction works 	Airport vicinities	Construction Phase	✓		 Maintain staging in works for vegetation clearing and top soiling Contractors' preparation of Re-vegetation Plan in progress to involve locals and women as well. 		
Sediment runoff which could damage aquatic and marine ecology or flooding issues	 Locate stockpiles in controlled areas Sub-grade and sub-base material placed quickly after removal of topsoil Planned construction work during dry season Removal of spoils and construction debris 	Downstream of Airport sites and waterways	Construction Phase	~		 Stockpiling away from waterbodies and drains. No works during rainy season Installation of sedimentation ponds 		
WATER QUALITY/QUANTITY								
Disruption of Surface and Ground Water	 Dimension of drains Diversion of stream Use of grassed areas for runoff Location of stockpiles on paved areas Removal of stockpiles after construction Re-vegetation after construction 	AirportandsurroundingareasandDownstreamfromconstructionareas	Duration of project	~		- Maintain proper drainage system to contain surface runoffs		
Contamination of nearby water bodies by toxic and hazardous substances	 Installation of oil and traps in drains Development of safe storage areas and proper handling of hazardous and toxic materials Proper disposition of hazardous and toxic materials 	Airport and surrounding areas	Duration of project	 Image: A start of the start of		- Maintain safe storage of toxic/hazardous materials		

				COMF	PLIED	REMARKS	
ENVIRONMENTAL 1350E	MITIGATION MEASURES	LOCATIONS		YES	NO	REWARNS	
Pollution from domestic sewage and wastes	 Proper solid waste management system to be practiced in work areas Installation of sanitation and treatment facilities in camps, offices and ancillary facilities 	Airport, Camps, Offices and Ancillary Facilities	Duration of project	~			
Contamination from oil and grease	 Collect and recycle petroleum products Development of spill contingency plans Construction of bund walls and drainage systems around fuel storage areas 	Ancillary Facilities	Duration of project	✓			
AIR POLLUTION							
Increase in levels of Total Suspended Particulates (TSP), SO2 and NO2	 Locate Ancillary Facilities away from residential and settlement areas Provide workers with Personal Protective Equipment (PPE) Proper maintenance of vehicles, machineries and equipment 	Airport site and adjacent villages and settlements	Pre-Construction and Construction Phase	~		 Vehicles and machineries are maintained at contactors workshop. 	
Health hazards and nuisances to nearby villages and settlements	 Regular monitoring of air quality in the vicinity of the airports and sensitive receptors 	Airport site and adjacent villages and settlements	Operation Phase	~		- Require environmental monitoring equipment to quantify. However, visual assessment indicated fewer nuisances tolerable to nearby settlement.	
NOISE POLLUTION							
Health risks to workers and residents of nearby villages and communities	 Control vehicles speed in work areas and sensitive locations Locate Ancillary Facilities away from residential and settlement areas Provide workers with Personal Protective Equipment (PPE) Proper maintenance of vehicles, machineries and equipment 	All construction areas, access routes, and quarry sites	Pre-Construction and Construction Phase	~		- Main provision of PPEs for all construction employees.	
Nuisance to residents of nearby villages and communities	 Establishment of buffers between airport and nearby settlement areas Preparation of operational procedures by Airport Operator based on ANZECC 1992 or Australian Noise Exposure Forecast (ANEF) 	Nearby settlements	Operation Phase	~		Contractors' vehicle and machineries Traffic is controlled and management strictly within airport are and main/access roads. - Limit use of vehicles, machines, crusher plant is done only during day time	
OCCUPATIONAL HEALTH AND SAFETY							
Hazards to worker's health and safety	 Construction methodology under control of Safety Officer and CSC Approved Contractor's Occupational Health and Safety Plan 	Airport sites	Pre-Construction and Construction Phase	√		 Maintain safety standards and practices on-site. OHS submitted and approved 	

			TIMEEDAME	COMF	PLIED	REMARKS
ENVIRONMENTAL 1550E	MITIGATION MEASURES	LUCATIONS		YES	NO	REMARNS
Spread of HIV and other communicable diseases	 Contractor to source labourers and workers from the nearby villages Contractors to increase awareness of workers 	Airport site and adjacent villages and settlements	Pre-Construction and Construction Phase	~		- HIV/AIDS awareness to be incorporated during construction
SOCIAL /COMMUNITY CONCERN	S					
Changes in nearby land values	Proper valuation of land	Surrounding areas and nearby villages	Operation phase	~		- Not required
Loss of aesthetics	Landscaping and re-vegetation	Vicinity of Airports	Duration of Project	~		- Not at this construction stage
Cultural differences risk/social conflicts	Contractor to source labourers and workers from the nearby villages	Airport site and adjacent villages and settlements	Pre-Construction and Construction Phase	~		- Well implemented
Slum creation risks	Demolition of structures as part of abandonment plan	Airport sites	Completion of Construction	~		- Not applicable (NA) at this construction stage
Disruption of utilities	Investigate limits to required services and minimize disruptions	Nearby settlements	Pre-Construction and Construction Phase	~		 No disruption to utilities. Contactors are made aware of the public utilities
Increase in traffic	Prepare traffic management plans	Airport vicinities and major roads into the Airports	Duration of Project	~		 Movement of cars/machinery into airside aided by NAC Safety Officer
						 Landside traffic is on normal road networks accept when needed guidance from NAC Safety Officer.
SITE ABANDONMENT						
Decommissioning of work sites	 Preparation of abandonment plan Return of all transient workers to original places of residences Demolition of temporary offices and contractor's depot area Dismantling of ancillary facilities Re-vegetation of exposed areas Proper disposition of construction debris 	Construction and camp sites	After completion of construction	~		 Not applicable at this construction stage. However, contractor is preparing a Site Abandonment Plan

ANNEX D: EMP IMPLEMENTATION – KUNDIAWA AIRPORT UPGRADING WORK

PROJECT NAME:	KUNDIAWA AIRPORT PAVEMENT UPGRADING & ASSOCIATED WORKS	Contract No:		PROVINCE:	CHIMBU PROVINCE
Date of Inspection:	December 2015	Inspected By (And Designation):	Barksy (PIU)	Initial	BP
Remarks [.]	Satisfactory	Witnessed By (And Designation)	Project Engineer(s)	Initial	SR/KD/AD
Romanio.		whitecood by (, and beolghallon).	Contractors Rep.	Initial	

	MITIGATION MEASURES	LOCATIONS	TIMEFRAME	COMPLIED		REMARKS	
ENVIRONMENTAL 1550E		LOCATIONS		YES	NO	ILMARKS	
SOIL EROSION							
Slope erosion and sedimentation of nearby water bodies	 Installation of silt traps on all drains Minimize clearing of vegetation and time surfaces are exposed Establish requisite temporary/permanent control structures Undertake immediate re-vegetation after completion of construction works 	Airport vicinities	Construction Phase	~		 Maintain staging in works for vegetation clearing and top soiling Contractors' preparation of Re-vegetation Plan in progress to involve locals and women as well. 	
Sediment runoff which could damage aquatic and marine ecology or flooding issues	 Locate stockpiles in controlled areas Sub-grade and sub-base material placed quickly after removal of topsoil Planned construction work during dry season Removal of spoils and construction debris 	Downstream of Airport sites and waterways	Construction Phase	~		 Stockpiling away from waterbodies and drains. No works during rainy season Installation of sedimentation ponds 	
WATER QUALITY/QUANTITY							
Disruption of Surface and Ground Water	 Dimension of drains Diversion of stream Use of grassed areas for runoff Location of stockpiles on paved areas Removal of stockpiles after construction Re-vegetation after construction 	Airport and surrounding areas and Downstream from construction areas	Duration of project	~		- Maintain proper drainage system to contain surface runoffs	

		LOCATIONS	TIMEFRAME	COMPLIED		DEMARKS
ENVIRONMENTAL 1550E	WITIGATION WEASURES	LOCATIONS		YES	NO	REIMARNO
Contamination of nearby water bodies by toxic and hazardous substances	 Installation of oil and traps in drains Development of safe storage areas and proper handling of hazardous and toxic materials Proper disposition of hazardous and toxic materials 	Airport and surrounding areas	Duration of project	✓		- Maintain safe storage of toxic/hazardous materials
Pollution from domestic sewage and wastes	 Proper solid waste management system to be practiced in work areas Installation of sanitation and treatment facilities in camps, offices and ancillary facilities 	Airport, Camps, Offices and Ancillary Facilities	Duration of project	~		
Contamination from oil and grease	 Collect and recycle petroleum products Development of spill contingency plans Construction of bund walls and drainage systems around fuel storage areas 	Ancillary Facilities	Duration of project	√		
AIR POLLUTION						
Increase in levels of Total Suspended Particulates (TSP), SO2 and NO2	 Locate Ancillary Facilities away from residential and settlement areas Provide workers with Personal Protective Equipment (PPE) Proper maintenance of vehicles, machineries and equipment 	Airport site and adjacent villages and settlements	Pre-Construction and Construction Phase	~		 Vehicles and machineries are maintained at contactors workshop.
Health hazards and nuisances to nearby villages and settlements	 Regular monitoring of air quality in the vicinity of the airports and sensitive receptors 	Airport site and adjacent villages and settlements	Operation Phase	V		- Require environmental monitoring equipment to quantify. However, visual assessment indicated fewer nuisances tolerable to nearby settlement.
NOISE POLLUTION						
Health risks to workers and residents of nearby villages and communities	 Control vehicles speed in work areas and sensitive locations Locate Ancillary Facilities away from residential and settlement areas Provide workers with Personal Protective Equipment (PPE) Proper maintenance of vehicles, machineries and equipment 	All construction areas, access routes, and quarry sites	Pre-Construction and Construction Phase	 ✓ 		- Main provision of PPEs for all construction employees.
Nuisance to residents of nearby villages and communities	 Establishment of buffers between airport and nearby settlement areas Preparation of operational procedures by Airport Operator based on ANZECC 1992 or Australian Noise Exposure Forecast (ANEF) 	Nearby settlements	Operation Phase	~		Contractors' vehicle and machineries Traffic is controlled and management strictly within airport are and main/access roads. - Limit use of vehicles, machines, crusher plant is done only during day time

		LOCATIONS	TIMEEDAME	COMP	PLIED	DEMARKS
ENVIRONMENTAL 1550E	MITIGATION MEASURES	LOCATIONS		YES	NO	REWIARNS
Hazards to worker's health and safety	 Construction methodology under control of Safety Officer and CSC Approved Contractor's Occupational Health and Safety Plan 	Airport sites	Pre-Construction and Construction Phase	√		Maintain safety standards and practices on-site.OHS submitted and approved
Spread of HIV and other communicable diseases	 Contractor to source labourers and workers from the nearby villages Contractors to increase awareness of workers 	Airport site and adjacent villages and settlements	Pre-Construction and Construction Phase	~		- HIV/AIDS awareness to be incorporated during construction
SOCIAL /COMMUNITY CONCERN	S					
Changes in nearby land values	Proper valuation of land	Surrounding areas and nearby villages	Operation phase	~		- Not required
Loss of aesthetics	Landscaping and re-vegetation	Vicinity of Airports	Duration of Project	~		- Not at this construction stage
Cultural differences risk/social conflicts	Contractor to source labourers and workers from the nearby villages	Airport site and adjacent villages and settlements	Pre-Construction and Construction Phase	~		- Well implemented
Slum creation risks	Demolition of structures as part of abandonment plan	Airport sites	Completion of Construction	~		- Not applicable (NA) at this construction stage
Disruption of utilities	Investigate limits to required services and minimize disruptions	Nearby settlements	Pre-Construction and Construction Phase	~		- No disruption to utilities. Contactors are made aware of the public utilities
Increase in traffic	Prepare traffic management plans	Airport vicinities and major roads into the Airports	Duration of Project	~		- Movement of cars/machinery into airside aided by NAC Safety Officer
						 Landside traffic is on normal road networks accept when needed guidance from NAC Safety Officer.
SITE ABANDONMENT	•		·	•		
Decommissioning of work sites	 Preparation of abandonment plan Return of all transient workers to original places of residences Demolition of temporary offices and contractor's depot area Dismantling of ancillary facilities Re-vegetation of exposed areas Proper disposition of construction debris 	Construction and camp sites	After completion of construction	 ✓ 		- Not applicable at this construction stage. However, contractor is preparing a Site Abandonment Plan

ANNEX E: PHOTOGRAPHS OF PROGRESSIVE WORKS – GIRUA AIRPORT



Picture 1: Gravel placement and compaction on the main runway



Picture 2: Gravel priming and lay down of bitumen at finish level.

A). Pavement & Drainage Works



Picture 3: Bitumen compaction is done soon after priming to avoid seepage and air pollution exposure.



Picture 4: Completed construction of open unlined drain to a required dimension and slope to contain highest rainfall from surface runoffs. Notice the Dash 8 aircraft landing from the new runway end with minimal dust emission generated from the pavement. The flight strip are and the drain is left stable for grass growth.



Picture 5: Construction of storm water drainage for proper drainage.

B). Site Camp



Picture 6: Maintaining cleanliness at the camp site. Soil expose areas are planted with grass and flowers for beatification and control of dust during sunny days, mud forming during rain.

ANNEX F: PHOTOGRAPHS OF PROGRESSIVE WORKS – VANIMO AIRPORT



A). Pavement Upgrading Works

Picture 7: Grubbing and scrubbing; top soiling and proper stockpiling. Constructing of open unlined drain (OUD) with proper dimension and slop design. Spoils are later used for top soiling and re-grassing.



Picture 8: Base course placement and compaction on the main runway. Notice moisture content of the base course to control excessive dust emission.



Picture 9: Grubbing and scrubbing works on flight strip. Topsoil; stockpiled appropriately and away from drains and water bodies.





Picture 9: New Palisade fencing installation works. Spoils are removed and cleared from working area. Top soiling is done later on embankment flanks to allow grass regrowth.

c). Campsite



Picture 10: Occupational Health, Environment and Safety Toolkit meeting carried out on site. This kind of meeting is done by contractors personnel's on a weeklybasis.



Picture 11: local woman are employed at the campsite to assist in kitchen, laundry and general cleaning works.

d). Gravel Extraction Site



Picture 12: The once narrow access road is improves to allow easy passage for truck load of coronus base course materials from the extraction site to the construction site. This road is now easily accessible by locals who live along the road. Dust is minimized using water truck



Picture 13: Gravel extraction site. Activities here are monitored to ensure no excessive dust, noise, or sedimentation occurs to nearby residents, communities, gardens and waterbodies.

ANNEX G: PHOTOGRAPHS OF PROGRESSIVE WORKS – KUNDIAWA AIRPORT



A). Pavement Works

Picture 14: lines drains with proper dimension and slope design to allow flow of surface runoffs. Grubbing and scrubbing of topsoil and stockpiling away from the drain.



Picture 15: topsoil clearing of flight strip and improving of the runway pavement. Notice the removal of the old picket fence around the airport. New fencing will be installed.



Picture 16: Use of white coloured geotextile to cover recently placed basecourse on the runway and allowing for grass regrowth on the topsoil stockpiles minimize the impact of sedimentation into the drains.



Picture 17: Placing and compacting of basecourse at the runway. The basecourse is mixed with water and cement when crushed which does not emit dust when placed on compacted.



Picture 18: Placing and spreading of topsoil stockpiles on the flight strip areas for re-grassing.



B). Crusher Plant on Site

Picture 19: Crusher plant on-site is maintained and kept clean. Operations are strictly during daytime hours and not night-time to avoid noise causing nuisance to nearby residents.

C). Fencing Installation Works



Picture 20: Installation of new palisade fencing materials around the airport boundary. This work is done mostly by the locals.



Picture 21: Laydown area is kept clean at all times. Cars, trucks, equipment are located in their appropriate areas next to the workshop ready to be maintained.

ANNEX H: PHOTOGRAPHS OF PROGRESSIVE WORKS – GOROKA AIRPORT



A). Mobilization



Picture 22: Establishment of contractors' office, personnel accommodation and dining area inside the project site. The area is kept clean at all times.

Picture 23: Establishment of contractors' crusher plant at Kamaliki River. The site has been used by other contractors in the past.



Picture 24: Establishment of contractors' batching plant at the project site. Drums are installed to collect concrete waste.



Picture 25: Establishment of contractors' workshop and storage area at the project site.



Picture 26: Gravel stockpile area at the project site. Notice the moist content of the gravels ensure minimal dust emission during stockpiling works.