

Semi-Annual Environmental Monitoring Report

Project number: 44240-013

Period: January – July 2017

BHU: Urban Infrastructure Project

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Semi-annual Environmental Monitoring Report

Reporting Period: *January - July 2017*

Urban Infrastructure Project (ADB Loan No. 2816-BHU)

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1 INTRODUCTION

1.1 Project Background

1. The Royal Government of Bhutan (RGoB) had signed a loan agreement (Loan Agreement No. 2258–BHU) in the year 2007 with the Asian Development Bank (ADB) for implementation of Urban Infrastructure Development Project (UIDP). The implementation activities have completed and project accounts closed in 2014 in . This project covered Thimphu, Phuentsholing and Dagana.

2. Later on Government expressed their need for further infrastructure development in Bhutan and requested ADB for project preparation to ensure sustainable urban development in additional towns. ADB conducted a PPTA study under TA 7360 and identified work components in the following towns – Thimphu, Phuentsholing, Samdrup Jongkhar and Rinchenthang (Nganglam). Accordingly a proposed Urban Infrastructure Project (UIP) framed up by ADB in the year 2011. It was materialized and planned that UIP would follow the ongoing Urban Infrastructure Development Project (UIDP). The main basis for urban infrastructure investment is the Government's Structure Plans and Local Area Plans (LAP). These LAPs prioritise urban infrastructure requirements with tentative costs. The aim of improving, upgrading and expanding the urban infrastructure facilities and providing basic urban services materialized when RGoB concluded a loan agreement with ADB.

3. The name of the project is “Urban Infrastructure Project” under ADB Loan 2816-BHU. The loan was approved by ADB in November 2011 and declared effective in April 2012. The project schedule is to start on May 2013 with a completion target date of 14 February 2018. The total project cost is estimated at \$23.3 million, of which ADB is financing \$19.8 million and the RGoB is financing \$3.5 million.

4. The Executing Agency (EA) is the Department of Urban and Engineering Services (DES) under MoWHS. The EA will be supported by its Project Management Unit (PMU) headed by a Project Manager (PM) and the Project Implementation Units (PIUs), headed by PM of the PIUs from the Project areas of Thimphu, Phuentsholing and Samdrup Jongkhar Thromdes. Further the PMU and the PIUs will be supported and guided by Project Management Consultancy (PMC) from SMEC, International Pty Ltd and the Design, Monitoring , supervision Consultancy (DMSC) from STUP Consultancy, Kolkata respectively.

1.2 Project Objectives

5. The project will support the Government's efforts toward sustainable urban development in Phuentsholing and Thimphu and Samdrup Jongkhar (SJM). Municipalities

1.3 Project Outputs

6. The project expects to achieve four major outputs: (i) water supply, sanitation and infrastructure rehabilitation and expansion, (ii) mobility improvement, (iii) urban management strengthening, and (iv) project management and capacity development.

1.4 Project Components

Table 1: Project components under various Thromdes

Sl. No.	Component	Thromde (Municipality)	Detail
1	12 MLD Waste water Treatment Plant (WWTP)	Thimphu	Construction of Wastewater Treatment Plant (initial plan was 14 MLD but reduced to 12 MLD after discussion)

Sl. No.	Component	Thromde (Municipality)	Detail
2	Road and Bridge	Phuentsholing	Planning, Survey, Investigation and Design of Second Bridge and Approach Roads
3	Water Supply, Waste water	Samdrup Jongkhar (Samdrup Jongkhar and Dewathang)	Water Resource Study Design of Water Supply facilities and rehabilitation Design of Wastewater facilities

Table 2: Sub-project status

Sl. No	Location	Sub-Project component (Package No)	Starting date of Implementation	Actual months of completion	Actual date of completion	Physical progress (%) as on 31 st July 2017
Component 1: Thimphu Thromde						
1	Babesa LAP	Construction of Wastewater Treatment Plant.	10/Nov/2016	30		- Office building 35% - Staff quarters 45% - 12 MLD WWTP not yet started.
Component 2: Phuentsholing Thromde						
1	Near Youth Center	Approach roads to & from bridge (PT/ADB/2014-15/PIU-12/20043 DATED 10 th April 2015)	4/May/2015	21	31/01/2017	Completed (Time extension was given till 31 st January 2017).
2	Over Om Chhu, near Youth Center	Construction of 46.8 m PSC Box Girder Bridge	1/August/2017	18		(Contract was awarded on the 20 th July 2017).
Component 3: Samdrup JongkharThromde						
1	Rikkechhu and Pinchinang (Char kilo)	Water supply: Intake, Transmission Main & WTP, Office building (SJT/ED/08/2015-2016/35 dated 18/4/2016) i) Intake ii) Transmission Mains iii) WTP iv) Clean Water Reservoir (CWR) v) Site office	1/5/2016	18	1/10/2017	Work under various stages of progress.

1.5 Institutional Set Up

7. The Executing Agency (EA) of this project is the Department of Engineering Services (DES) under the Ministry of Works and Human Settlements (MoWHS). The EA will be assisted by a Project Management Unit (PMU) and Project Implementation Units (PIUs) for the project areas of Thimphu, Phuentsholing, Samdrup Jongkhar Thromdes.

8. The project management assistance for the project will be provided by a Project Management Consultancy (PMC)

9. Design, Monitoring and Supervision Consultant (DMSC) is responsible for detailed design engineering, monitoring and construction supervision of the different project components. M/s STUP Consultants P. Ltd, India in association with Progressive Research Consultancy Services (PRCS), Bhutan has been appointed as the DMSC of this project.

1.6 Responsibilities and Scope of DMSC

10. DMSC concluded (is it conducted/executed) an agreement with MoWHS which defines that the inputs of the DMSC work will be time based input. The key function of the DMSC team is in the domain of design and construction supervision.

11. The responsibilities of the individual key personnel/experts of the DMSC team and expected outputs from the different project components are described in the ToR.

12. The Project sites are Thimphu, Phuentsholing, and Samdrup Jongkhar Thromdes (Municipalities). The broad scope of work under different categories in the respective project sites is given below :

Table 3: Broad scope of works component wise

Component	Activities
WWTP (Thimphu)	Construction of Thimphu Wastewater Treatment Plant: <ul style="list-style-type: none"> Review and approval of contractor's design and construction drawing Assisting the Thimphu PIU in construction monitoring Helping PIU in technology transfer during O&M phase
Bridge & roads (Phuentsholing)	Planning, Survey, Investigation and Design of Second Bridge and Connecting Roads in Phuentsholing – <ul style="list-style-type: none"> To evolve the best possible alignment of the proposed bridge/flyover and the associated connecting/approach roads To carry out detailed engineering design of the most suitable option for road and bridge/flyover works and prepare cost estimates for obtaining sanction of the project
Water Supply & Waste water facilities (S. Jongkhar)	Water Resource Study and Design of Water Supply and Waste water facilities in Samdrup Jongkhar municipality (Samdrup Jongkhar and Dewathang) – <ul style="list-style-type: none"> Study, survey (except topographical survey) and investigation of the existing water supply sources, water treatment facilities, storage and distribution system Identification of new water source, augmentation of the existing treatment facilities and development of necessary treatment system, augmentation and development of storage system and laying of additional distribution network Development of Water safety plan Development of required sewerage system in line with the development plans including suitable wastewater treatment plant Preparation of necessary tender documents of all the work components Provide assistance in bidding process and in construction supervision.

2 IMPLEMENTATION PROGRESS

2.1 Major Works and Progress

13. **Thimphu Thromde:** The contract of Design, Build, Operate and Transfer of 12 MLD Wastewater Treatment Plant at Babesa LAP, Thimphu was awarded to Technofab-Vishwa Joint Venture on the 20th October 2016. The duration of the contract is for 30 months, effective from 10th November 2016 till 9th May 2019. Construction of staff quarters and office building is ongoing simultaneously. A summary of work scope and current status is given in Table 4: However the construction of 12 MLD WWTP is yet to be started.

14. **Phuentsholing Thromde:** Approach roads and Bridge Project works started from the 4th May 2015. During the field visit it was observed that the construction of the approach roads was completed. The contractor was carrying out some rectification works prior to handing over the works to the client. The contractor still had 4 (four) numbers of electric posts to be erected.

15. The contract package awarded to Tundi Construction, Nepal was bifurcated into two components, (i) Bridge and (ii) Approach Road following a decision made by the Technical Complete considering the problem faced on site to drive the test pile. Therefore the bridge work has not been started.. The new bridge to be constructed is a 46.8 m PSC Box Girder Bridge. The work has been awarded to M/S Bhutan Builders on the 20th July 2017. The contract duration is of 18 months, effective from the 1st August 2017 till 31st January 2019.

16. **Samdrup Jongkhar Thromde:** The contract for the Water Supply works was awarded to M/S Tundi-Tacho Joint Venture, Phuentsholing on the 18th April 2016. Significant progress has been achieved so far since the ground-breaking ceremony held on the 6th June 2017. Many awarded works are in the various stages of progress as per schedule. Table 4 shows summary of the scope of works along with present work status. Expected changes from approved objectives, remedial measures and key risks/assumptions in achieving the objectives are reflected in the table.

- i) Monitoring and reporting on Environmental and Social safeguard have been started. No adverse effects from the project activities on social and environmental components observed so far.

Table 4: Major works (scope and progress)

Sl. No	Location	Sub-projects components (Package No)	Listing of works under the package	Type of works at present	Expected changes from approved scope	Fulfillment of objectives- Type of remedial measures needed	Key assumptions and risks that affect attainment of the objectives
Component 1: Thimphu Thromde							
1	Babesa, Thimphu	Construction of Waste Water Treatment Plant.	<ul style="list-style-type: none"> Construction of 12 MLD WWTP Construction of Office building Construction of staff quarters. 	<ul style="list-style-type: none"> Not started. Ongoing. Ongoing. 	None	<ul style="list-style-type: none"> Effective monitoring and strict application of EMP. 	No risk.
Component 2: Phuentsholing Thromde							
1	Phuentsholing (Near Youth Center)	Construction of approach roads, drains, footpath, roundabout, median and erection of electric light posts. (Vide contract No. PT/ADB/2014-15/PIU-12/20043 DATED 10th April 2015)	<ul style="list-style-type: none"> Construction of roads Construction of pedestrian foot path. Construction of drains. Construction of road medians, Erection of electric lamp posts. Bio-engineering works. 	<ul style="list-style-type: none"> Complete. Complete. Complete. Complete Near completion. (4 nos. still to be erected). 4 poles erected before taking over the site from the contractor) Not executed. 	None	<ul style="list-style-type: none"> Effective monitoring and strict application of EMP. 	No risk.
2	Phuentsholing (Over Om Chhu, near Youth Center)	Construction of 46.8 m PSC Box Girder Bridge over Om chhu, (near Youth Center).	<ul style="list-style-type: none"> Excavation (earth work) for bridge foundation. Construction of abutments and wells, wing walls etc. Construction of deck, crash barriers, railing posts, safety kerbs, toe walls etc. Erection of electric lamp posts. Painting of bridge. 	Contractor yet to mobilize labours and machineries to site.	None	<ul style="list-style-type: none"> Effective monitoring and strict application of EMP. 	No risk.

Sl. No	Location	Sub-projects components (Package No)	Listing of works under the package	Type of works at present	Expected changes from approved scope	Fulfillment of objectives- Type of remedial measures needed	Key assumptions and risks that affect attainment of the objectives
Component 3: Samdrup Jongkhar Thromde							
1	Water supply i. Intake, Trunk Mains and approach road (from Rikkechhu, at Pinchinang or Char' kilo).	Construction of intake, road, transmission main, CWT (Vide contract No. SJT/ED/08/2015-2016/35 dated 18/4/2016)	<ul style="list-style-type: none"> Intake: Construction of a 3 m high weir structure on Rikkechhu. Laying of main line. Construction of Fish-ladder. Construction of 25 m of access road on the right bank. Fencing of Intake site. 	<ul style="list-style-type: none"> 95 %Complete. Not started.. Complete. Ongoing. Not yet started. 	None	<ul style="list-style-type: none"> Effective monitoring and strict application of EMP. 	No risk.
	ii. WTP at Pinchinang	Construction of Water Treatment Plant	<ul style="list-style-type: none"> Construction of WTP 	<ul style="list-style-type: none"> Not yet started.. 	None	<ul style="list-style-type: none"> Effective monitoring and strict application of EMP. 	No risk.
	iii. Clean Water Reservoir (CWR) at Pinchinang,	Construction of CWR.	<ul style="list-style-type: none"> Construction of CWR. 	<ul style="list-style-type: none"> 75% Complete. 	None	<ul style="list-style-type: none"> Effective monitoring and strict application of EMP. 	No risk.
	iv. Transmission line (CWR-250m ³ existing reservoir)	Laying of transmission line.	<ul style="list-style-type: none"> Laying of Transmission line from CWR to 250m³ existing reservoir. 	<ul style="list-style-type: none"> Not started. 	None	<ul style="list-style-type: none"> Effective monitoring and strict application of EMP. 	No risk.
	v. Site office at Pinchinang.	Construction of office.	<ul style="list-style-type: none"> Construction of Administrative Building at Pinchinang 	<ul style="list-style-type: none"> 65% Complete 		<ul style="list-style-type: none"> Effective monitoring and strict application of EMP. 	No risk.

3 ENVIRONMENTAL PROCEDURE REVIEW

3.1 Environmental Legal requirements

- i) **Annexure 1** lists those Acts, Rules, Policies and Regulations currently in force in the country and deal with all environmental issues that could apply to infrastructure development. Due to relatively minor negative impacts of sub-projects under UIP, it is expected that most of the subprojects should not fall within the scope of these legal instruments. However, subprojects and activities that need certain legal compliance are:
- Any component that requires acquisition of forest land.
 - Water Treatment Plants (WTP) and Sewage Treatment Plant (STP).
 - Composting and landfill facilities.
 - Road construction activities.

18. **Table 5** shows some of the specific requirements to ensure compliance by these components/subcomponents are:

Table 5: Action required ensuring subcomponents comply with national environmental laws

Sl. No	Component	Applicable Legislation	Compliance	Action Required
1	Water Supply, Water Treatment Plant (WTP) and Sewage Treatment Plant (STP).	Environmental Assessment Act, 2000 The National Environment Protection Act, 2007. Waste Prevention and Management Act of Bhutan, 2009. Bhutan Water Vision and Bhutan Water Policy The Water Act of Bhutan, 2011.	Obtain Environmental Clearance (EC) from the National Environmental Commission Secretariat (NECS)	Carry out EIA and build and operate as per approved EMP.
2	All composting and landfill facilities.	Environmental Assessment Act, 2000 The National Environment Protection Act, 2007. Waste Prevention and Management Act of Bhutan, 2009. National Strategy & Action Plan: Integrated Solid Waste Management, January 2007 Thimphu Municipal Solid Waste Management Rules and Regulations 2007.	Obtain Environmental Clearance (EC) from the National Environmental Commission Secretariat (NECS)	Carry out EIA and build and operate as per approved EMP.
3	Road construction activities	Environmental Assessment Act, 2000 The Road Act of the Kingdom of Bhutan, 2004.	Obtain Environmental Clearance (EC) from the National Environmental Commission Secretariat (NECS)	Carry out EIA and build and operate as per approved EMP.

3.2 Compliance with Environmental Regulations

Table 6: Status of Environment, Forest and other clearances

Sl. No.	Sub-projects components (Package No)	Environmental Clearance (EC) required or not (Yes or No)	Status of Environmental Clearance
Component 1: Thimphu Thromde			
1	Construction of Waste Water Treatment Plant.	Yes	EC obtained vide letter No. NECS/CMD/Thimphu Thromde/2568/2016/788 dated May 16, 2016 and valid upto May 15, 2019.
Component 2: Phuentsholing Thromde			
1	Construction of approach roads	Yes	EC obtained vide letter No. MoWHS/PPD/Env/01/2015/3083 dated May 16 th , 2016 and valid upto 8 th April 2017. Renewed on 29 September 2017 and valid until 28 Sept 2020.
2	Construction of bridge	Yes	EC processed with NEC. Yet to receive the clearance.
Component 3: Samdrup Jongkhar Thromde			
1	Water Supply: Construction of Intake, Trunk Line, WTP, Distribution Network,	Yes	EC obtained vide NECS/ESD/Dzo-S/Jongkhar/3208/2015/2544 dated 15 May 2015 and valid up to 14 May 2017. EC extension/renewal has been processed by Thromde vide letter no. SJT/ESS-07/2016-2017/1429 dated 19 th April 2017. NEC clearance renewal under process.

4 IMPLEMENTATION STATUS OF MITIGATION MEASURES

19. Out of the 4 subprojects awarded 1 subproject has been successfully completed with other subprojects currently under various stages of implementation. EMP has been implemented in all the completed/running projects as per IEE report. Overall compliance status of EMP application and actions needed are discussed below and shown in Table 7.

20. For implementation of EMP, procurement of PPE as per the Occupation Health & Safety Regulations of RGoB has been complied with by the contractor. Provisions of safe and clean drinking supplies, proper toilets with reasonable living camps are in place. Safety/cautionary signs are in place at site. During monitoring site visits the contractors are constantly explained/instructed to follow the specified clauses of BID Document and also the conditions of Environmental Clearance to mitigate environmental and social impacts. ANNEX –2 shows checklist of instructions for the contractor on application of EMP.

Table 7: Compliance Status with Environmental Management and Monitoring Plans.

Component 1: Thimphu Thromde

Table 7-1(a): Environmental Monitoring Plan of WWTP

Aspects / Parameters to be monitored	Location	Means of Monitoring	Frequency	Implementation Responsibility	Compliance Monitoring Responsibility	Monitoring Cost	Compliance Assessment		
							Complied	Not Complied	Rectification actions required if 'not complied'.
PRE-CONSTRUCTION PHASE									
Specific provision in tender documents on archeological/ cultural relics	Civil works excavations	Verify draft and final documents	Twice – draft and final documents	Design consultants	PMU	Part of project management in detailed design (minimal cost)	√	-	-
Consultation meetings; Specific provisions in tender documents on nuisance & problems to public	Access route to WWTP	Verify meetings documentation; Verify draft and final documents	After completion of meetings; Twice – draft and final documents	PIU, Design consultants	PMU	Part of project management in detailed design (minimal cost)	√	-	-
CONSTRUCTION PHASE									
Total area to be exposed; runoff flowing into disturbed sites	WWTP site	Visual inspection of sites; plans verification	Daily during rainy periods	Contractor	Construction supervision consultants, PIU	Part of consultant's construction supervision contract; minimal cost to PIU	-	√	WWTP construction yet to start.
Noise levels not to exceed 55 dB(A) during daytime and 45 dBA during nighttime	WWTP site	Use of sound levels meter	Daily	Contractor	Construction supervision consultants, PIU	Part of consultant's construction supervision contract; minimal cost to PIU	-	√	WWTP construction yet to start.
Dust, cover of stockpiles, smoke belching	WWTP site	Visual inspection of sites	Daily	Contractor	Construction supervision consultants, PIU	Part of consultant's construction supervision contract; minimal cost to PIU	√	-	-
BOD and suspended solids of existing WWTP	existing WWTP discharge outfall	Laboratory testing of parameters	Weekly for suspended solids; monthly	Contractor	Construction supervision consultants.	Part of consultant's construction	√	-	- Contractor is not responsible for this. - The WWTP laboratory

Aspects / Parameters to be monitored	Location	Means of Monitoring	Frequency	Implementation Responsibility	Compliance Monitoring Responsibility	Monitoring Cost	Compliance Assessment		
							Complied	Not Complied	Rectification actions required if 'not complied'.
discharge			for BOD		PIU	supervision contract; minimal cost to PIU			conducts BOD/COD testing twice a month (1 st week & last week of every month).
Volume of sludge from ponds	Decommissioned ponds of existing WWTP	Visual inspection of pond	During period of sludge removal	Contractor	Construction supervision consultants, PIU	Part of consultant's construction supervision contract; minimal cost to PIU	-	-	No sludge removed so far.
Oil and other hazardous materials spills	WWTP site	Visual inspection of sites	Daily	Contractor	Construction supervision consultants, PIU	Part of consultant's construction supervision contract; minimal cost to PIU	√	-	-
Sanitary toilets, garbage bins, runoff controls	Workers camps	Visual inspection of camps	Once before start of construction and once monthly	Contractor	Construction supervision consultants, PIU	Part of consultant's construction supervision contract; minimal cost to PIU	√	-	-
Construction wastes	WWTP site	Visual inspection of sites	Once before final stage of demobilization	Contractor	Construction supervision consultants, PIU	Part of consultant's construction supervision contract; minimal cost to PIU	-	√	Construction of staff quarters and office building ongoing.
Number of local labor employed	WWTP site	Verification of contractor's records	Once a month	Contractor	PIU	No cost	√	-	- 3 local labours - 17 national staff - 10 non-national labours (masons, carpenters)
OPERATION PHASE									
NEC 2010 <i>Environmental Discharge Standards</i> : BOD 30mg/L, TSS 100mg/L, fecal coliform 1000 MPN/100 ML	WWTP discharge point	Effluent sampling and laboratory tests using the existing laboratory of the WWTP	twice monthly	Thimphu Thromde	NEC	Part of TT's operation cost	-	√	Thimphu Thromde to conduct once the WWTP is operational.
Trees and shrubs	Perimeter of WWTP	Visual inspection of sites	Once a year	TDM	NEC	Minimal cost to NEC since this is visual inspection	-	-	-"

Aspects / Parameters to be monitored	Location	Means of Monitoring	Frequency	Implementation Responsibility	Compliance Monitoring Responsibility	Monitoring Cost	Compliance Assessment		
							Complied	Not Complied	Rectification actions required if 'not complied'.
						only			
Safety station, warning signs, and fence	WWTP	Visual inspection of sites	Once a year	TDM	NEC	Minimal cost to NEC since this is visual inspection only	-	-	-"
Health safety plan; workers training	WWTP	Verification of plan & operation records	Once a year	TDM	NEC	Minimal cost NEC since this is visual inspection only	-	-	-"
Empty septic tanks	Houses to be connected to the new sewerage system	Visual inspection of sites	Upon connecting of houses to new sewerage system	TDM	NEC	Minimal cost to NEC since this is visual inspection only	-	-	-"

Table 7-1 (b): Project Performance Monitoring of WWTP

Desired Outcomes	Aspects / Parameters to be monitored	Means of Monitoring	Frequency	Implementation	Compliance Monitoring	Monitoring Cost	Compliance Assessment		
							Complied	Not complied	Rectification actions required if 'not complied'
PRE-CONSTRUCTION									
Detailed design is environmentally responsive	EMP requirements incorporated in detailed design	Verify detailed design documents; EMP requirements reflected in tender documents	Two reviews: (i) draft detailed design documents and (ii) prior to approval of final documents	PIU, Design consultants	PMU	Minimal cost	√	-	-
Tendering process advocates environmentally responsible procurement	EMP requirements incorporated in construction contracts	Verify construction contract documents;	Prior to finalization of construction contract documents	PIU	PMU	Minimal cost	√	-	-
CONSTRUCTION PHASE									
Effective management of environmental impacts during construction	Number of public complaints on construction activities	Verification of contractor's records; PIU's coordination with local	Once a month	Contractor	Construction supervision consultants, TT's PIU	Part of consultant's construction supervision contract: minimal	√	-	No public complaints so far.

Desired Outcomes	Aspects / Parameters to be monitored	Means of Monitoring	Frequency	Implementation	Compliance Monitoring	Monitoring Cost	Compliance Assessment		
							Complied	Not complied	Rectification actions required if 'not complied'
		officials				cost to TT's PIU			
Reduce risk to public during construction	Number of accidents involving construction activities	Verification of contractor's records; TT's PIU coordination with local officials	Once a month	Contractor	Construction supervision consultants, PIU, PMU	Part of consultant's construction supervision contract; minimal cost to TY's PIU	√	-	-
OPERATION PHASE									
WWTP effluents meets NEC standards	NEC 2010 <i>Environmental Discharge Standards</i> : BOD 30mg/L, TSS 100mg/L, fecal coliform 1000 MPN/100 ML	effluent sampling and laboratory test	quarterly	TDM	NEC	Part of TT's operation cost (USD15,000 /year)	-	-	WWTP yet to be operational.
WWTP Operation acceptable to the public	Public Complaints on WWTP operation	Verification of operation records	Once a year	TDM	NEC	Minimal cost	-	-	WWTP yet to be operational.

Component 2 : Phuentsholing Thromde

Table 7-2 (a): Environmental Mitigation Plan

Project Activity	Potential Environmental Impact	Proposed Mitigation Measure or Enhancement Measure	Location	Mitigation Cost	Responsibility Implementation/ Supervision	Compliance Assessment		
						Complied	Not Complied	Rectification actions required if 'not complied'.
PRE-CONSTRUCTION PHASE								
Excavation requirements	Potential damage to archaeological and cultural assets	Tender documents shall include a provision that will require construction activities to be stopped immediately upon discovery of any archaeological and cultural relics and authorities will be informed promptly	Roads	Part of detailed design cost	Design Consultants / PMU and PIU	√	-	-
Design of bridge pier	Scouring of pier base due to	Bridge pier design shall include scour	Bridge pier	Part of detailed	Design Consultants / PMU and PIU	√	-	-

Project Activity	Potential Environmental Impact	Proposed Mitigation Measure or Enhancement Measure	Location	Mitigation Cost	Responsibility Implementation/ Supervision	Compliance Assessment		
						Complied	Not Complied	Rectification actions required if 'not complied'.
	vortex-induced turbulent flows	countermeasures to prevent the occurrence of vortex-induced turbulent flows such as placement of precast concrete armor units around the base of the pier		design cost				
Social and community concerns	Potential nuisance and problems to the public	Consultation with the affected communities regarding the expected impacts and proposed mitigation measures of the project; Tender documents shall include provisions addressing the potential nuisances and problems to the public during construction phase	roads	Part of detailed design cost	PIU, Design Consultants / PMU	√		-
CONSTRUCTION PHASE								
Road construction and other civil works	Soil erosion and sediments of construction sites during rainy periods	Total area exposed shall be minimized; use of temporary diversion drains and catch drains at work sites.	Roads, bridge abutments	Incorporated in construction contract	Contractor / PIU, Supervision Consultants	-	√	Bridge Tender under evaluation.
Pile driving for bridge	Underwater sound pressure generation harmful to fish and aquatic animals	Use of soft-start pile driving; installing a sleeve casing lined with polyurethane around the pile with some clearance and within the entire water depth during pile driving; whenever possible, schedule the pile driving activities during non-summer months where the river flow is very small	Bridge pier	Incorporated in construction contract	Contractor / PIU, Supervision Consultants	-	-	Construction yet to start.
Road construction and other civil works	Nuisance from noise of construction equipment	Consultation with affected areas; not to operate noisy equipment during nighttime (22:00 – 06:00); sound suppression for equipment; ear plugs for workers	Roads, bridge abutments	Incorporated in construction contract	Contractor / PIU, Supervision Consultants	√	-	- Road works nearing completion. - Bridge works yet to be tendered out.
Road construction	Air pollution due to	Water spraying for dust control; construction	Roads, bridge	Incorporated in construction	Contractor / PIU, Supervision	√	-	- Bridge works yet to be tendered out.

Project Activity	Potential Environmental Impact	Proposed Mitigation Measure or Enhancement Measure	Location	Mitigation Cost	Responsibility Implementation/ Supervision	Compliance Assessment		
						Complied	Not Complied	Rectification actions required if 'not complied'.
and other civil works	construction activities	materials with potential for significant dust generation shall be covered; not smoke belchers equipment	abutments	contract	Consultants			
Road construction and other civil works	Traffic congestion and hindrance to access	Close coordination with local authorities in road closure and traffic rerouting; contractor's traffic plan	Roads	Incorporated in construction contract	Contractor / PIU, Supervision Consultants	√	-	-
Road construction and other civil works	Pollution and health risks due to workers camp	Proper camp sanitation; installation of sanitary facilities; solid waste management; surface runoffs control	Workers camp	Incorporated in construction contract	Contractor / PIU, Supervision Consultants	√	-	-
Road construction and other civil works	Hazard to public due to construction activities	Implement road safety plan and safety measures including warning signs to alert people of hazards around the construction sites, barricades, and night lamps for open excavations	Roads, bridge abutments	Incorporated in construction contract	Contractor / PIU, Supervision Consultants	√	-	- Road works nearing completion. - Bridge works yet to be tendered out. - Besides the proposed mitigation measures, the bridge construction site will be cordoned off for unauthorized people;
Road construction and other civil works	Occupational health and safety at work sites	implement health and safety plan; equipped first aid station available at all times, potable water and adequate sanitation facilities provided to workers; providing workers with clean eating areas; providing the workers with personal protective equipment	Roads, bridge, and abutments	Incorporated in construction contract	Contractor / PIU, Supervision Consultants	√	-	- Road works nearing completion. - Bridge works yet to be tendered out.
Rehabilitation and closure of construction sites	Improper closure of construction sites	Removal of all construction wastes and implement surface restoration	Roads, bridge abutments, pier	Incorporated in construction contract	Contractor / PIU, Supervision Consultants	-	√	- Works ongoing.
Road construction and other civil works	Increase employment opportunities	Contractor required to give preference to local labor; workers recruitment to be coordinated with local officials	Roads and bridge	No cost	Contractor / PIU, Supervision Consultants	√	-	- Local labours employed for road works. - Bridge works yet to start.
OPERATION PHASE								

Project Activity	Potential Environmental Impact	Proposed Mitigation Measure or Enhancement Measure	Location	Mitigation Cost	Responsibility Implementation/ Supervision	Compliance Assessment		
						Complied	Not Complied	Rectification actions required if 'not complied'.
Interaction of the bridge pier with river flows	Scouring of pier base due to vortex-induced turbulent flows	Placement of precast concrete armor units at the pier base	Bridge pier	Part of construction cost	Contractor / PIU, Supervision Consultants (installation during construction)	-	√	- Roads and Bridge not yet operational.
Public use of bridge and roads	Waterlogging and soil erosion due to clogged and inadequate drainage facilities	Regular maintenance of culverts and drains to maintain their design capacities; regular removal of accumulated sediments and debris in the drainage system; regular inspection of discharge points to streams to ensure they are stable and not deteriorating due to scour; ensuring appropriate water carrying capacities of the road drainage system through detailed study of the road catchment hydrology during the design phase	Road drainage	Part of operation & maintenance costs	Phuentsholing Thromde	-	√	- Roads and Bridge not yet operational.
Public use of bridge and roads	Increase risk of accidents	strong information and education campaign at the local level on the risks of accidents; improvement of crossing sites such as providing the appropriate signs and markings; speed-limiting measures such as provision of speed limit signs and active police enforcement of speed limits at densely-populated areas; provision of adequate road shoulders	Bridge and roads	Part of operation & maintenance costs	PT	√	- √	- Roads and Bridge not yet operational.
Public use of bridge and roads	Increase risk of water pollution	Implementation of spills response plan specific that include procedures on (i) how to stop the flow	Bridge and roads	Part of operation & maintenance costs	PT	√	-	- Roads and Bridge not yet operational.

Project Activity	Potential Environmental Impact	Proposed Mitigation Measure or Enhancement Measure	Location	Mitigation Cost	Responsibility Implementation/ Supervision	Compliance Assessment		
						Complied	Not Complied	Rectification actions required if 'not complied'.
		of spill, (ii) contain the spill to prevent from spreading including the storage of absorbent material for spills, and (iii) cleanup of the spilled materials.						
Public use of bridge and roads	Increase noise levels due to increase vehicular traffic	Installation of noise barrier	Youth center at the right bank of the river	Part of construction cost	Contractor / PIU, Supervision Consultants (installation during construction)			- Roads and Bridge not yet operational.

Table 7-2 (b): Environmental Monitoring Plan

Aspects / Parameters to be monitored	Location	Means of Monitoring	Frequency	Implementation Responsibility	Compliance Monitoring Responsibility	Monitoring Cost	Compliance Assessment		
							Complied	Not complied	Rectification actions required if 'not complied'.
PRE-CONSTRUCTION PHASE									
Specific provision in tender documents on archeological/ cultural relics	Bridge abutment areas	Verify draft and final documents	Twice – draft and final documents	Design consultants	PMU	Part of project management in detailed design (minimal cost)	√	-	-
Design contract includes provision of scour countermeasure of bridge pier	Bridge pier	Verify draft and final documents	Twice – draft and final documents	PIU	PMU	Part of project management in detailed design (minimal cost)	√	-	-
Consultation meetings; Specific provisions in tender documents on nuisance & problems to public	roads	Verify meetings documentation; Verify draft and final documents	After completion of meetings; Twice – draft and final documents	PIU, Design consultants	PMU	Part of project management in detailed design (minimal cost)	√	-	-
CONSTRUCTION PHASE									
Total area to be exposed; runoff flowing into disturbed sites	Roads, abutment areas	Visual inspection of sites; plans verification	Daily during rainy periods	Contractor	Construction supervision consultants, PIU	Part of consultant's construction supervision	√	-	- Roads works ongoing. - Bridge works yet to start.

Aspects / Parameters to be monitored	Location	Means of Monitoring	Frequency	Implementation Responsibility	Compliance Monitoring Responsibility	Monitoring Cost	Compliance Assessment		
							Complied	Not complied	Rectification actions required if 'not complied'.
						contract; minimal cost to PIU			
soft-start pile driving; sleeve casing lined with polyurethane around the pile during pile driving	Bridge pier	Visual inspection of pile driving activity	Daily	Contractor	Construction supervision consultants, PIU	Part of consultant's construction supervision contract; minimal cost to PIU	-	√	- Bridge works yet to start.
Noise levels not to exceed 55 dB(A) during daytime and 45 dBA during nighttime in residential areas; for commercial areas should not exceed 65 dB(A) during daytime and 55 dBA during nighttime	Bridge and roads	Use of sound levels meter	Daily	Contractor	Construction supervision consultants, PIU	Part of consultant's construction supervision contract; minimal cost to PIU	√	-	- Works are stopped during night time.
Dust, cover of stockpiles, smoke belching	roads	Visual inspection of sites	Daily	Contractor	Construction supervision consultants, PIU	Part of consultant's construction supervision contract; minimal cost to PIU	√	-	-
Road closure and traffic rerouting	roads	traffic plans verification	weekly	Contractor	Construction supervision consultants, PIU	Part of consultant's construction supervision contract; minimal cost to PIU	√	-	
Sanitary toilets, garbage bins, runoff controls	Workers camps	Visual inspection of camps	Once before start of construction and once monthly	Contractor	Construction supervision consultants, PIU	Part of consultant's construction supervision contract; minimal cost to PIU	√	-	-
Road safety plan; sign, barricades and night lamps	roads	Visual inspection of sites	Daily	Contractor	Construction supervision consultants, PIU	Part of consultant's construction supervision contract; minimal cost to PIU	√	-	-

Aspects / Parameters to be monitored	Location	Means of Monitoring	Frequency	Implementation Responsibility	Compliance Monitoring Responsibility	Monitoring Cost	Compliance Assessment		
							Complied	Not complied	Rectification actions required if 'not complied'.
Health and safety plan; first aid station, potable water and adequate sanitation facilities; clean eating areas; personal protective equipment	Roads, bridge abutment s area	Check copy of health and safety plan; visual inspection of sites	daily	Contractor	Construction supervision consultants, PIU	Part of consultant's construction supervision contract; minimal cost to PIU	√	-	- Road works. - Bridge works yet to start.
Construction wastes	Roads, bridge abutment s area	Visual inspection of sites	Once before final stage of demobilization	Contractor	Construction supervision consultants, PIU	Part of consultant's construction supervision contract; minimal cost to PIU	-	√	- Works yet to be completed.
Number of local labor employed	Construc tion sites	Verification of contractor's records	Once a month	Contractor	PIU	No cost	√	-	- 5 local labours - 10 staff (Bhutanese)
OPERATION PHASE									
Occurrence of vortex-induced turbulent flows at bridge pier	Bridge pier	Visual inspection	Once a month during rainy season	PT	people's representative (Thuemi)	Part of PT's operation cost	-	√	- Roads and Bridge yet to be operational.
Clogged culvert and drains	roads	Ocular inspection of facilities	5 times per year	PT	people's representatives (Thuemi)	Part of PT's operation cost	-	√	- Roads and Bridge yet to be operational.
Vehicular accidents involving pedestrians	Bridge and roads	Verification of community and police records	Twice per year	PT	people's representatives (Thuemi)	Minimal cost to PT	-	√	- Roads and Bridge yet to be operational.
Fuel and other materials spills	Bridge and roads	Verification of community and police records	Once a month	PT	people's representatives (Thuemi)	Minimal cost to PT	-	√	- Roads and Bridge yet to be operational.
Noise levels	Youth center	Use of noise meter	Twice per year	PT	people's representatives (Thuemi)	Part of PT's operation cost	-	√	- Roads and Bridge yet to be operational.

Component 3: Samdrup Jongkhar Thromde

Table 7-3 (a): Environmental Monitoring Plan

Aspects / Parameters to be monitored	Location	Means of Monitoring	Frequency	Implementation Responsibility	Compliance Monitoring Responsibility	Monitoring Cost	Compliance Assessment		
							Complied	Not complied	Rectification actions required if 'not complied'.
PRE-CONSTRUCTION PHASE									
Specific provision in tender documents on archeological/ cultural relics	Pipeline trenches, civil works excavations	Verify draft and final documents	Twice – draft and final documents	Design consultants	PMU	Part of project management in detailed design (minimal cost)	√	-	-
Consultation meetings; Specific provisions in tender documents on nuisance & problems to public	Pipeline routes	Verify meetings documentat ion; Verify draft and final documents	After completion of meetings; Twice – draft and final documents	PIU, Design consultants	PMU	Part of project management in detailed design (minimal cost)	√	-	-
CONSTRUCTION PHASE									
Total area to be exposed; runoff flowing into disturbed sites	Pipeline routes	Visual inspection of sites; plans verification	Daily during rainy periods	Contractor	Construction supervision consultants, PIU	Part of consultant's construction supervision contract; minimal cost to PIU	√	-	-
Water supply interruptions; materials and solid wastes dumped in watercourses	Pipeline routes	Visual inspection of sites; work schedules verification	Daily	Contractor	Construction supervision consultants, PIU	Part of consultant's construction supervision contract; minimal cost to PIU	√	-	-
Noise levels in rural areas not to exceed 55 dB(A) during daytime and 45 dBA during	Pipelines routes	Use of sound levels meter	Daily	Contractor	Construction supervision consultants, PIU	Part of consultant's construction supervision contract; minimal cost to	√	-	-

Aspects / Parameters to be monitored	Location	Means of Monitoring	Frequency	Implementation Responsibility	Compliance Monitoring Responsibility	Monitoring Cost	Compliance Assessment		
							Complied	Not complied	Rectification actions required if 'not complied'.
nighttime; Noise levels in commercial areas not exceed 65 dB(A) during daytime and 55 dBA during nighttime						PIU			
Dust, cover of stockpiles, smoke belching equipment	Pipeline routes	Visual inspection of sites	Daily	Contractor	Construction supervision consultants, PIU	Part of consultant's construction supervision contract; minimal cost to PIU	√	-	-
Road closure and traffic rerouting	Pipelines routes	traffic plans verification	weekly	Contractor	Construction supervision consultants, PIU	Part of consultant's construction supervision contract; minimal cost to PIU	-	√	- Not required as the pipeline routes are away from road/traffic.
Sanitary toilets, garbage bins, runoff controls	Workers camps	Visual inspection of camps	Once before start of construction and once monthly	Contractor	Construction supervision consultants, PIU	Part of consultant's construction supervision contract; minimal cost to PIU	√		
Road safety plan; sign, barricades and night lamps	Pipelines routes	Visual inspection of sites	Daily	Contractor	Construction supervision consultants, PIU	Part of consultant's construction supervision contract; minimal cost to PIU	-	√	- Not required as the pipeline routes are away from road/traffic.
Construction wastes and surplus soil	Pipeline routes, slow sand filter, pumping station	Visual inspection of sites	Once before final stage of demobilization	Contractor	Construction supervision consultants, PIU	Part of consultant's construction supervision contract; minimal cost to PIU	√	-	-

Aspects / Parameters to be monitored	Location	Means of Monitoring	Frequency	Implementation Responsibility	Compliance Monitoring Responsibility	Monitoring Cost	Compliance Assessment		
							Complied	Not complied	Rectification actions required if 'not complied'.
Number of local labor employed	Pipeline routes	Verification of contractor's records	Once a month	Contractor	PIU	No cost	√	-	- 3 local labours - 9 staff (Bhutanese) - 2 staff (foreign) - 25 labours (foreign)
OPERATION PHASE									
E. Coli bacteria; water physical & chemical parameters	Pipelines, reservoirs, and pumping station,	Water sampling and laboratory test	Monthly for bacteria; annual for physical & chemical	Samdrup Jongkhar Thromde	MoWHS	Part of operation cost	-	√	- Water Supply System yet to be operational.
Septic tanks	Areas with water service connections	Verification of Municipal Engineer's records	Once a year	Samdrup Jongkhar Thromde	MoWHS	Minimal cost	-	√	- Water Supply System yet to be operational.
liquid chlorine usage	Pumping stations	Verification of operation records	Once a year	Samdrup Jongkhar Municipality	MoWHS	Minimal cost			- Water Supply System yet to be operational.

Table 7-3 (b): Project Performance Monitoring of Samdrup Jongkhar

Desired Outcomes	Aspects / Parameters to be monitored	Means of Monitoring	Frequency	Implementation	Compliance Monitoring	Monitoring Cost	Compliance Assessment		
							Complied	Not Complied	Rectification actions required if 'not complied'.
PRE-CONSTRUCTION									
Detailed design is environmentally responsive	EMP requirements incorporated in detailed design	Verify detailed design documents; EMP requirements reflected in tender documents	Two reviews: (i) draft detailed design documents and (ii) prior to approval of final documents	Design consultants	PMU	Minimal cost	√	-	-
Tendering process advocates environmentally responsible procurement	EMP requirements incorporated in construction contracts	Verify construction contract documents;	Prior to finalization of construction contract documents	PIU	PMU	Minimal cost	√	-	-
CONSTRUCTION PHASE									
Effective management of	Number of public	Verification of contractor's	Once a month	Contractor	Construction supervision	Part of consultant's	√	-	- No public complaints so far.

Desired Outcomes	Aspects / Parameters to be monitored	Means of Monitoring	Frequency	Implementation	Compliance Monitoring	Monitoring Cost	Compliance Assessment		
							Complied	Not Complied	Rectification actions required if 'not complied'.
environmental impacts during construction	complaints on construction activities	records; PIU coordination with local officials			consultants, PIU	construction supervision contract; minimal cost to PIU			
Reduce risk to public during construction	Number of accidents involving construction activities	Verification of contractor's records; PIU coordination with local officials	Once a month	Contractor	Construction supervision consultants, PIU	Part of consultant's construction supervision contract; minimal cost to PIU	√	-	-
OPERATION PHASE									
Water quality meets drinking water standards	Required drinking water quality parameters	Water sampling and laboratory test	Monthly for bacteria; annual for physical and chemical	Samdrup Jongkhar Thromde	MoWHS	Part of operation cost	-	√	- Water Supply System yet to be operational.

5 ENVIRONMENTAL MONITORING AND EVALUATION

21. For effective monitoring, selected environmental parameters have been identified as indicators which may be qualitatively and quantitatively measured and compared over a period of time in order to assess/ensure the compliance of EMP. The environmental performance indicators are physical, biological and social characteristics identified as most important in affecting the environment at critical locations all along the sub-project corridors. The parameters identified as performance indicators are:

- Air, noise and water quality
- Compliance to EMP
- Compliance to national environmental regulations.

6 MAJOR PROJECT ISSUES AND PROBLEMS

22. Till date no major issues, as such and problems arose at the project locations.

7 GRIEVANCE REDRESSAL MECHANISM

23. To address any complaint due to the project activities Grievance Redressal Mechanism (GRM) has been established. (A detailed mechanism and process has been described and annexed as Annexure 7). However, till date no complaints have reached the PIU.

8 CONSULTATIONS AND RECOMMENDATIONS

24. For protection of local environment during construction phase application of mitigation measures started as per the specified EMP. Some (informal) public consultation has taken place during construction/implementation phase. The general recommendations as per present observations are given in Table 8 below.

Table 8: Recommendations and Suggestions

Sl. No.	Issues	Recommendations & Suggestions
1	Non-compliance to EMP during works execution.	<ul style="list-style-type: none">- Effective implementation of Environmental Management Plan has to be ensured by contractors where the present status is partially satisfactory.- Environmental safety officers/staff to be mobilized by contractors to ensure that OHS, PPE and other environmental issues are addressed timely.
2	Procedural delays in obtaining clearances.	<ul style="list-style-type: none">- To avoid extension of time and levy of penalties, expedite the clearance process by fixing a time frame with respective departments with constant follow ups.
3	Debris disposal	<ul style="list-style-type: none">- In some cases proper debris disposal needs to be carried out.

25. An action plan considered for satisfactory environmental compliance as per the present sub-project activities are given in Table 9.

Table 9: Action plan considered for Satisfactory Environmental Compliance

Action	Responsibility	Time frame
Instruction to contractors and monitoring for <ul style="list-style-type: none">➤ Proper disposal of debris and quick disposal of excavated surplus earth material.➤ Complete use of PPE.➤ Restoration of road/lane after pipe	Contractors, PIU, DMSC	Continuous.

laying at the earliest. ➤ Camp site management. ➤ Water sprinkling during dry period. ➤ Use of safety tape/barricade/caution board etc.		
Follow up action for environmental clearances /consent	PIU, PMU	At the earliest

List of Acts, Rules & Regulations and Policy Guidelines

The Royal Government of Bhutan has formulated various policy guidelines with ACTs, Rules and Regulations aimed at environmental sustenance for all times to come. Some of the relevant documents are listed below.

1. Regulation for the Environmental Clearance of Projects & Regulation on Strategic Environmental Assessment 2002, NECS, Thimphu Bhutan.
2. Environmental Codes of Practices for Highways and Roads, September 1999, DoR, MoWHS, Thimphu.
3. Sectoral Guidelines for Highways and Roads, NEC, 2004.
4. Explosive Rules, Ministry of Home Affairs, Thimphu and guidelines by Department of Geology and Mines.
5. Blasting Manual, Helvetas Bhutan, Suspension Bridge Unit
6. General Rules and Regulations on Occupational Health and Safety (OHS) in Construction, Manufacturing, Mining and Service Industries, 2006, RGoB Ministry of Labour and Human Resources, Thimphu.
7. Environmental Assessment Act, 2000, RGoB, National Environment Commission Thimphu.
8. Forest and Nature Conservation Act, 1995,
9. The National Environmental Protection Act, 2007.
10. Environmental Discharge Standard, August 2004.
11. Explosive Rules, Ministry of Home Affairs, Thimphu (Publication year unknown).
12. The Road Act of the Kingdom of Bhutan, 2004.
13. Waste Prevention and Management Act of Bhutan, 2009.
14. National Strategy & Action Plan- Integrated Solid Waste Management, January 2007, MoWHS.
15. Thimphu Municipal Solid Waste Management Rules and Regulations 2007.
16. Bhutan Water Vision 2025 and Bhutan Water Policy, NEC, RGoB.
17. The Water Act of Bhutan, 2011.

Instructions for Contractor – Environmental Safeguard

- Setting up camp/office with proper sanitation condition, solid waste management facility, clean and sufficient drinking water supply. Non cutting of trees during setting up camp.
- Camps to have First Aid Kits with medicines all the time.
- Ensure everyone in the camp uses mosquito nets while sleeping to prevent any outbreak of malaria.
- Ensure no sharp and protruding objects are found in work sites and camp areas that will injure workers.
- Construction and use of separate garbage pits for bio-degradable and non-biodegradable wastes.
- Removal/disposal of overburden earth/stone materials at the earliest without any accumulation at working sites.
- Proper disposal of other construction waste.
- Proper storage of construction materials.
- Filling up trenches and open excavated areas before monsoon.
- Felling of trees if done to be compensated by plantation.
- Scheduling of work without any social impact e.g. avoid or prevent any disruption of movement of pedestrian/other disturbances etc.
- Regular water sprinkling at construction site during dry season.
- Covering of materials during transportation/carrying.
- Ensure spoils and debris are not dumped in the Omchuu river during bridge construction.
- Personnel safety of workers- use of personal protective equipment (PPE) viz. ear plugs, nose masks, safety belt, helmet, gloves, gumboots etc at working sites.
- Regular maintenance of vehicles/machinery to reduce noise pollution.
- Implementation of traffic diversion measures including use of safety tape/ barricade/caution signboards at working sites.
- Proper drainage of waste water/rain water from camps/working sites
- Arrangement of common medicine and First Aid box at camp site.
- Some basic firefighting tools/provisions in camps.
- Awareness program on HIV/AIDS.
- All construction debris such as empty cement bags, logs/formwork woods and planks, plastics to be removed from river Rikkechhu.
- Some quantity of free flowing water must be ensured in the river (Rikkechhu) for unobstructed movement of fishes and other aquatic lives, including the construction of 'fish-ladder' in the river.

Testing parameters

1. **Air pollution monitoring** – for STP- 2 locations nearby STP site for 4 days 24 hrs.
for SPM, RSPM, SO₂, NO_x and CO
2. **Surface water quality**- At least 2 surface water quality (pond, river, streams) samples
in and around STP (if location exist)

Parameter

Turbidity NTU

pH

Total Suspended Solid mg/l

Total Dissolved Solid mg/l

Total Hardness as CaCO₃ mg/l

Dissolved Oxygen mg/l

Biological Oxygen Demand mg/l

Chemical Oxygen Demand mg/l

Chloride mg/l

Sulphate mg/l

Nitrate mg/l

Sodium mg/l

Potassium mg/l

Calcium mg/l

Magnesium mg/l

Iron mg/l

Manganese mg/l

Cadmium mg/l

Arsenic mg/l

Chromium mg/l

Copper mg/l

Mercury mg/l

Lead mg/l

Selenium mg/l

Aluminium mg/l

Zinc mg/l

Boron mg/l

Fluorine mg/l

Chlorine (residual free) mg/l

Phenolic Compound mg/l




Cyanide mg/l





Phosphate mg/l




Checklist.





Sl. No	Location	Sub-Project component (Package No)	Starting date of Implementation	Projected months of completion	Status as on 31st July 2017	Environmental Safeguards		
						Environmental Clearance (EC)	EMP Implementation	Status of EMP Implementation
Component 1: Thimphu Thromde								
1	Babesa –LAP	Construction of WWTP. (TCC/WWTP/GM/001)	10/11/2016	30	Construction of Staff quarters / Office building ongoing. WWTP not yet started. Site office completed and operational.	Yes	Yes.	Satisfactory
Component 2: Phuentsholing Thromde								
1	Near Youth Center	Approach roads to & from bridge (Vide contract No. PT/ADB/2014-15/PIU-12/20043 dtd 10 th April 2015)	4/5/2015	21	Completed	Yes	Yes	Satisfactory
2	Over Om Chhu, near Youth Center	Construction of 46.8 m PSC Box Girder Bridge	1/8/2017	18	Work not yet started.	PIU has applied for EC to NEC.	Will be implemented	Will be evaluated once works start.
Component 3: Samdrup Jongkhar Thromde								
1	Rikkechu and Pinchinang (Char kilo)	Water supply: Intake, Transmission Main & WTP, Office building (Vide contract No. <u>SJT/ED/08/2015-2016/35 dated 18/4/2016</u>) i) Intake ii) Transmission Mains iii) WTP iv) Clean Water Reservoir (CWR) v) Administrative office	1/8/2009	16	Completed	Yes	Yes	Satisfactory




PHOTOGRAPHS





Sl. No	Name of work/activities	Present status	Support picture reference	Remarks
1. Thimphu Thromde				
a	Project signboard	Erected		Project signboard with relevant information in place.
b	Construction of Office building.	Ongoing.		Labourers with safety helmets, boots at site.
c	Construction of Staff quarters.	Ongoing.		Adequate use of safety equipment at site.




d	Toilets and bathrooms provided in the camps.	Constructed and in place.		Material (sand) properly stockpiled at site.
e	Labour camp	Constructed.		Piped drinking water, drains and garbage pits in place in the camps.
f	Site office	Complete		Semi-permanent site office constructed and in use. (The area is fenced along with a project signboard erected.)
g	Conference Hall. (The Site Office has a Conference Hall which can accommodate about 12 people.)	Operational.		Meeting with the PIU at site office, during field visit.


h	3-D Model of the WWTP complex.	Constructed		On display at Site office.
2. Phuentsholing Thromde				
a	Round-about near Youth Center.	Completed.		Building on the left is the Youth Centre.
b	Demobilization of contractor's labour camps.	Ongoing.		Dismantling of the labour camps.

c	Rectification works of footpath, road median.	Near completion.		Approach road towards the Youth Centre side (seen on the right side).
d	View of approach road from round-about below Youth Center.	Completed		Youth Centre on the left.
e	PIU explaining bio-engineering works carried out in the round about.	Ongoing		Site visit with the Project Manager, PIU.
f	View of approach road with drains, footpath and railings on the left bank of Om chhu.	Completed		Police out post (left) and the Youth Centre (right) seen are on the right bank of Omchhu.

g	Proposed 46.8 m PSC Box Girder Bridge over Om chhu, (near Youth Center).	Work awarded to M/S Bhutan Builders on 20 th July 2017.		Bridge site (as seen from left bank of Om chhu)
3. Samdrup Jongkhar Thromde				
a	Contractor's Camp site.	Completed.		Discussions at the contractor's camp site, PIU, Contractor and DMSC team.
b	Entertainment facility.	Installed.		One satellite Disc TV installed in the camp for labours and contractor. Television sets also provided in the camp.

c	Camp sites (camps for contractor's staff and labourers)	Complete.		The camp has piped drinking water supply, toilet/bathroom facilities and two garbage pits (for organic and non-organic wastes).
d	Toilet/bathroom facility. (Camp site).	Provided.		Proper toilet with water supply and septic tank (see inserted box) provided.
e	Garbage pits. (Camp site)	Constructed.		Kitchen wastes, plastics, papers and mineral bottles etc being dumped in the pits.
f	Sign boards. (Camp site)	Erected.		Sign boards indicating "Organic waste" and "Non-Organic Waste" for waste segregation.

g	Administrative building.	Construction ongoing.		Labourers using PPE (helmets and gumboots) at work site.
h	Intake site.	Near completion.		Wier and approach road parking area (on the right bank).
i	Intake site.	Near completion.		Approach road for future maintenance works (right bank), fish ladder, pre-sedimentation tank (left bank) and embankment walls in progress at Rikkechhu.

j	Stepped fish-ladder at Intake site on Rikkechhu.	Completed.		Stepped fish-ladder of 6" height at an interval of 1 m for free movements (upstream / downstream) of fish and other aquatic species provided.
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ENVIRONMENT CLEARANCES**1. Thimphu Thromde: WWTP Construction**

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 དཔལ་ལྷན་འབྲུག་གཞུང་།
National Environment Commission
 Royal Government of Bhutan



NECS/CMD/Thimphu Thromde/2568/2016/788

May 16, 2016

ENVIRONMENTAL CLEARANCE

The National Environment Commission Secretariat (NECS) is pleased to renew environmental clearance in respect of the Thimphu District Municipality as approved during the meeting held on May 12, 2016 for the installation and operation of Waste Water Treatment Plant at Babesa under Thimphu Thromde with the following terms and conditions:

1. As per section 28.3 of the Regulation for the Environmental Clearance of Projects 2002, any modification of proposal/application shall take place only with prior approval from NECS;
2. **The holder shall ensure that this environmental clearance is valid only for the installation and operation of Waste Water Treatment Plant (WWTP) at Babesa under Thimphu Thromde;**
3. The holder shall ensure that the installation and operation of the WWTP is in line with the National Environment Protection Act 2007, Environment Assessment Act 2000 and its Regulation 2002, Waste Prevention & Management Act of Bhutan 2009 and its Regulation 2012 and The Water Act of Bhutan 2011;
4. The holder shall ensure that the installation and operation of the WWTP complies with the Environmental Standards 2010;
5. The holder shall ensure strict compliance to the Undertaking submitted to NECS;
6. The holder shall ensure compliance to all terms and conditions of stakeholder clearances at all times;
7. The holder shall ensure that the operation of WWTP is carried out as per the application submitted for environmental clearance;
8. **The holder shall ensure that the installed capacity of the WWTP is 14 Million Liter Per Day as stated in the application;**
9. The holder shall ensure that use of ozone depleting substances are restricted in line with the revised Regulation on Control of Ozone Depleting Substances, 2008;
10. The holder shall ensure that polychlorinated biphenyl is never used as transformer and capacitor oil;
11. The holder shall ensure that installation and operation of the WWTP is within the allocated area;
12. The holder shall ensure that local residents, households, communities, public, private parties and any religious, cultural, historic and ecologically important sites are not adversely affected by the activity;
13. The holder shall be solely responsible for any dispute arising from the installation and operation of the WWTP;
14. The holder shall ensure that import and use of secondhand equipment and machineries are strictly prohibited;
15. The holder shall ensure that import and use of hazardous wastes are strictly prohibited;
16. The holder shall ensure that NECS and any other relevant authorities are informed of any unanticipated or unforeseen chance-find of any precious metals or minerals or articles, that have economic, cultural, religious or ecological importance;
17. **The holder shall ensure that the existing WWTP is fully decommissioned and converted into recreational area once the new WWTP is commissioned as stated in**

Received: _____
 Date: 19/5/16
 Signature: _____
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the application;

18. The holder shall ensure that the construction sites are completely barricaded prior to starting any activity to avoid adverse visual impacts during constructions;
19. The holder shall ensure that all excavated materials are re-used or disposed within the premise as stated in the application;
20. The holder shall ensure that spillage and roll over of excavated materials are avoided at all times;
21. **The holder shall ensure that sludge generated from the WWTP is used as manure/soil conditioner if found non toxic;**
22. **The holder shall ensure that disposal of sludge in water bodies and other surrounding environment is avoided at all times;**
23. The holder shall ensure that the activity doesn't lead to blockage, storage or diversion of river, stream, irrigation channel, waterfall, underground water source or any other water resource or water course;
24. The holder shall ensure that untreated effluent is not discharged into the surrounding environment;
25. The holder shall ensure that proper records are maintained for effluent discharges and submitted to NECS quarterly;
26. The holder shall ensure that fugitive emissions from the activities are controlled using appropriate measures;
27. **The holder shall ensure that the technology adopted for the WWTP is of Intermittent Decanted Aerated Lagoon which is equivalent to Sequential Batch Reactor as stated in the application;**
28. The holder shall ensure that no foul odour is emitted from the WWTP;
29. The holder shall ensure that the operation of WWTP is closely monitored to avoid malfunction and breakdown and ultimately avoid nuisance due to foul odour at any point of time;
30. The holder shall ensure that adequate safety gadgets and outfits such as safety helmets, eye goggles, breathing masks, ear muffs, safety boots, etc. are provided to all the workers and any other person entering the WWTP;
31. The holder shall ensure that safety signs are posted at strategic locations within the WWTP premises indicating areas where specific safety gadgets are required;
32. The holder shall ensure that adequate lighting and ventilation facilities are provided within the WWTP;
33. The holder shall ensure that general housekeeping, cleanliness and hygiene are maintained at all times in the WWTP;
34. The holder shall ensure that first-aid kit is available in the WWTP at all times;
35. The holder shall ensure that adequate space is maintained within the WWTP premises to facilitate mobility;
36. The holder shall ensure that adequate fire fighting facilities are installed and expiry dates of such facilities are checked and kept valid at all times;
37. The holder shall ensure that proper health check up facilities are provided to all employees and health records are maintained;
38. The holder shall ensure that underage workers are not employed at all times;
39. The holder shall ensure that trees are Planted within the WWTP premises upon consultation with Department of Forest and Park Services to maintain greenery and improve aesthetic/visual impact of the area;
40. The holder shall ensure that adequate sanitation facilities are provided to workers and employees;
41. The holder shall ensure that separate budget is maintained for environmental activities;

42. The holder shall ensure that signboard is erected at the work site displaying the name of the Project and contact address of the implementing agency;
43. The holder shall ensure that a copy of this environmental clearance is available at the work site at all times;
44. The holder shall develop contingency plan to deal with unforeseen environmental risks, hazards & accidents and submitted to NECS within three months from the date of renewal of this environmental clearance;
45. **The holder shall ensure that renewal of this environmental clearance is processed at least one month prior to its expiry along with a copy of environmental clearance and a report on the implementation of its terms and conditions;**
46. The holder shall develop detailed implementation plan focusing on the terms and conditions of this environmental clearance and submitted to NECS within three months from the date of renewal of this environmental clearance; and
47. The holder shall ensure strict implementation of the terms and conditions of this environmental clearance at all times.

Failure to comply with any of the above terms and conditions shall constitute an offence under the Environmental Assessment Act 2000, its Regulations 2002, the National Environment Protection Act 2007 and any other relevant laws. Penalties for such offences shall include but not limited to suspension and/or revocation of environmental clearance in part or whole without any liability on the part of the Royal Government.

This environmental clearance is valid till May 15, 2019 and is subject to periodic review and changes.


Secretary

To,
The Executive Secretary,
Thimphu District Municipality,
Post Box No- 215,
Thimphu- 11001

Copy to:

1. The Dzongkhag Environment Officer, Dzongkhag Administration, Thimphu for necessary action.
2. Guardfile (Thimphu Thromde), CMD, NECS for record.

2. Phuentsholing Thromde: Approach roads & Bridge construction



འབྲུག་རྒྱལ་ཁབ་ཀྱི་རྒྱུ་རྩལ་ལྷན་ཁག།
ROYAL GOVERNMENT OF BHUTAN
MINISTRY OF WORKS & HUMAN SETTLEMENT
POLICY & PLANNING DIVISION
THIMPHU: BHUTAN



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MoWHS/ PPD/Env/01/2015/ 3083

April 9, 2015

Dasho Thrompoen
Phuntsholing Thromde
Phuntsholing, Chukha

Subject: Renewal of Environmental Clearance for construction of Bridge and approach road over Om Chhu, Phuntsholing

Sir,

The MoWHS issues the Environmental Clearance for construction of Bridge and approach road over Om Chhu, Phuntsholing Thromde with the following terms and conditions:

1. The EC is valid only for the construction of the above mentioned activity;
2. Prior to the start of the project, the proponent should be responsible for relocating the Thromde Electrical Office and re-instate the street light poles and water supply that would be affected by the bridge construction;
3. The waterways must be protected from any obstruction during and after the construction;
4. The implementation of the activity shall not affect the public and any religious/historic site;
5. The applicant shall ensure that safety signs are posted at the strategic locations within project site;
6. Downstream affects should be monitored at all times to ensure that no damage is caused due to the project activity;
7. The Occupational Health and Safety measures are strictly observed at all times;
8. The holder shall ensure that underage workers are not employed;
9. All activities pertaining to this road shall be in line with the Environmental Codes of Practice for Highways and Roads 1999 (Department of Roads, Ministry of Works and Human Settlement), the Guidelines for Highways and Roads 2004 (NEC), and the Forest and Nature Conservation Act 1995;
10. Blasting must be carried out as per the rules and regulations of the Ministry of Home and Cultural Affairs. Ensure that proper warning signals are given prior to blasting;
11. Environmentally Friendly Road Construction (EFRC) techniques shall be adopted to minimize environmental damages;
12. Indiscriminate dumping of excavated materials is an offense and liable for penalty; Construction spoils must not be allowed to contaminate watercourses. The dumpsite for such materials must be secured so that they should not leach into the ground water;
13. Side drains, cross drains and support structures like retaining/breast walls shall be constructed to prevent future soil erosion and landslides;

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Fax: 00975-2-323121
Po Box: 791



དཔལ་ལྷན་འབྲུག་གཞུང་། འབས་ཏྲིག་ལྷན་ཁག།
 ROYAL GOVERNMENT OF BHUTAN
 MINISTRY OF WORKS & HUMAN SETTLEMENT
 POLICY & PLANNING DIVISION
 THIMPHU: BHUTAN



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14. The holder shall ensure that wastes generated at the project site are managed as per the requirements of the Waste Prevention and Management Act of Bhutan 2009 and Waste Prevention and Management Regulation 2012;
15. Aesthetic value must be preserved/enhanced by reclaiming the disturbed area with re-vegetation of grasses or trees in consultation with the Department of Forest;
16. Any disputes arising due to the project are the responsibility of the Project Proponent; and
17. Copy of this EC must be maintained at site at all times during construction of the bridge for environment management and monitoring references.

Any violation of the terms and conditions is a violation of Article 7 of EA Act 2000 which will result in revocation of the EC. In case of non-completion of the activity within the given period, the EC must be renewed one month prior to the date of its expiry.

This Clearance is valid for the construction of Bridge and approach road over Om Chhu till April 08, 2017

Yours faithfully,


 (Sangay Tenzin)
 Offg. Chief Planning Officer

Copy to:

1. Hon'ble Secretary, MoWHS for kind information.
2. Executive Secretary, Phuntsholing Thromde
3. Chief, ES Division, NEC, Thimphu for information.
4. Project Coordinator, PMU, DES, MoWHS
5. Project Director, DES, MoWHS
6. Project Manager, Phuntsholing Thromde

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 Po Box: 791

Email correspondence with Ms. Anu Pradhan, Project Manager, PIU Phuentsholing Thromde regarding Environment Clearance for Bridge works.

“ **Kamal Dan Chamling** <chamlingkd@gmail.com>

to Anu

Dear Anu,
Thank you for the comments and EC copies. The EC renewed vide MoWHS/PPD/Env/01/2015/3083 dtd April 9, 2015 with validity till April 08, 2017 has expired. Please give me the new renewed one if you have, if not the letter sent for renewal of the EC. ADB would want this detail when they upload this EMR in their website.

Thank you and regards.

Chamling

Thimphu





Anu Pradhan

J
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to me

Sir,
We have applied for new one since renewing will not make sense for bridge works only. So will update you once we get the clearance.”

3. Samdrup Jongkhar Thromde: Water Supply

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དཔལ་ལྷན་འབྲུག་གཞུང་།
National Environment Commission
Royal Government of Bhutan

NECS/ESD/Dzo-S/Jongkhar/3208/2015/ 2544 May 15, 2015

ENVIRONMENTAL CLEARANCE

The National Environment Commission Secretariat (NECS) is pleased to issue environmental clearance in respect of Executive Secretary, Samdrup Jongkhar Thromde as per the decision of the Environmental Assessment Technical Committee during its meeting on May 8, 2015 for the **rehabilitation of water supply system within Samdrup Jongkhar Thromde** with following terms and conditions:

1. As per the Section 28.3 of the Regulation for the Environmental Clearance of Projects, 2002, any modification of proposal/application shall take place only with prior approval from NECS;
2. **The holder shall ensure that this environmental clearance is valid only for the rehabilitation of water supply system within Samdrup Jongkhar Thromde;**
3. The holder shall ensure that activity is in line with the National Environment Protection Act 2007, Environmental Assessment Act 2000 and its Regulation 2002, Waste Prevention & Management Act of Bhutan 2009 and its Regulation 2012 and The Water Act of Bhutan 2011;
4. The holder shall ensure that the activity complies with the Environmental Standards 2010;
5. The holder shall ensure strict compliance to the Undertaking submitted to NECS;
6. The holder shall ensure that the activity are carried out as per the application submitted for environmental clearance;
7. The holder shall ensure compliance to all the terms and conditions of stakeholder clearances at all times;
8. The holder shall be solely responsible for any dispute arising due to the activity;
9. The holder shall ensure that local residents, households, communities, public, private parties and any religious, cultural, historic and ecologically important sites are not adversely affected by the activity;
10. The holder shall ensure that tapping of water from the Rikkechhu is in line with the provisions of Water Regulation 2014;
11. The holder shall ensure that NECS and any other relevant authorities are informed of any unanticipated or unforeseen chance-find of any precious metals or minerals or articles, that have economic, cultural, religious or ecological importance;
12. The holder shall ensure that excavated materials are never pushed downhill but are loaded, hauled and dumped at the pre-identified/approved spoil dumpsites to avoid downstream environmental damages
13. The holder shall ensure that activity does not lead to blockage, storage or diversion of river, stream, irrigation channel, waterfall, underground water source or any other water resource or water course;
14. The holder shall ensure that no effluents or wastes of any kind are discharged into water

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resources or water bodies;

15. The holder shall ensure that adequate trenches and barriers such as check dams, log barriers or boulder barriers are constructed at the spoil dumpsites and other required areas depending on the site condition prior to dumping and excavations;
16. The holder shall ensure that drains and channels are constructed within and around the dumpsites for channeling of surface runoff water to avoid erosion of dumped materials which may cause corresponding downstream environmental damages;
17. The holder shall ensure that dumpsites are stabilized and vegetated with local plant species to prevent potential soil erosion and to blend with the surrounding environment;
18. The holder shall ensure that all disturbed areas are re-vegetated by adopting different bioengineering techniques depending on the site conditions;
19. The holder shall ensure that felling of trees, if required are done only upon obtaining approval from the concerned Division of the Department of Forest and Park Services;
20. The holder shall ensure that adequate safety gadgets and outfits such as safety helmets, eye goggles, breathing masks, ear muffs, safety boots, etc. are provided to all workers and any other person entering the work site;
21. The holder shall ensure that wastes generated from labour camps and site offices are managed as required under the Waste Prevention and Management Act of Bhutan 2009 and its Regulation 2012;
22. The holder shall ensure that littering is avoided at all times;
23. The holder shall ensure that first aid-kits are available at the site at all times;
24. The holder shall ensure that underage workers are not employed for the activity;
25. The holder shall ensure that safety signs are posted at strategic locations, including signboards indicating areas where specific safety gadgets are required;
26. The holder shall ensure that signboard is erected at the work site displaying the name of the Project and contact address of the implementing agency;
27. The holder shall ensure that a copy of this environmental clearance is available at the work site at all times;
28. The holder shall develop contingency plan to deal with unforeseen environmental risks, hazards & accidents and submitted to NECS within **three (03) months** from the date of issue of this environmental clearance;
29. The holder shall ensure that NECS is informed at least one (01) month prior to the completion of the activity along with a copy of the environmental clearance and report on the implementation of its terms and conditions;
30. The holder shall ensure that renewal of this environmental clearance is processed at least one (01) month prior to its expiry along with a copy of environmental clearance and a report on the implementation of its terms and conditions;
31. The holder shall develop detailed implementation plan focusing on implementation of the environmental terms and conditions and submit to NECS within **three (03) months** from the date of issue of environmental clearance; and
32. The holder shall ensure strict implementation of the terms and conditions of this environmental clearance at sites at all times.

Failure to comply with any of the above terms and conditions shall constitute an offence under the Environmental Assessment Act 2000, its Regulations 2002, the National Environment Protection Act 2007 and any other relevant laws. Penalties for such offences shall include but not limited to suspension and/or revocation of environmental clearance in part or whole without any liability on the part of the Royal Government.

This environmental clearance is valid up to May 14, 2017 and is subject to periodic review and changes.



Chief Environment Officer
Environment Services Division

To,

The Executive Secretary
Samdrup Jongkhar Thromde

Copy to:

1. The Offg. Secretary, NECS, Thimphu for kind information.
2. The Chief Environment Officer, Compliance Monitoring Division, NECS, Thimphu for necessary action.
3. The Environment Officer, Dzongkhag Administration, Samdrup Jongkhar for necessary action.
4. Guard file (S/Jongkhar Thromde), ESD, NECS for record.



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THROMDE ADMINISTRATION
SAMDRUP JONGKHAR



SJT/PIU-ADB/25/2016-2017/108

Date 18/4/2017

The Environment Officer
Samdrupjongkhar Thromde

Subject: Renewal/Extension of Environmental Clearance.

Madam,

This is to inform you for your kind necessary action that, the Environment Clearance of ongoing ADB Water Supply Project under Samdrup Jongkhar Thromde is expiring on 14th May 2017. In this regard, the office of PIU (Project Implementation Unit), Samdrup Jongkhar Thromde would like to request your good office to kindly process for Renewal/Extension of the Clearance validity till one year that is up to 14th May, 2018.


The reason for required of time extension or renewal of Environment Clearance is that the project period is up to 1st October, 2017 where the construction activities on the ground will not be completing within the project period due to some unavoidable hindrances. Further, upon completion of the project, it required some time to get Commission the project and part of remedial works to carry out.

Therefore, with the above mentioned reasons this office would like to request your good office to kindly renew or Extension the validity of the Clearance for one more year up to 14th May, 2018.

Enclosed:

- Copy of existing EC
- Brief report on implementation of provided EC

Yours sincerely,


Mani K. Khali
Project Manager,
PIU, S/Jongkhar

Copy to:

1. The Project Director, ADB, DES, MOWHS, Thimphu for kind information please
2. The Executive Secretary, SJT for kind information please.
3. The Project engineer, PIU, SJT for follow up accordingly.
4. Office copy



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THROMDE ADMINISTRATION
SAMDRUP JONGKHAR



SJT/ESS-07/2016-2017/1429

19th April, 2017

Chief Environment Officer
Environment Service Division
National Environment Commission
Thimphu

Subject: Environment Clearance Extension

Sir,

This is to bring to your kind consideration that the Environment Clearance issued by your office for the **rehabilitation of water supply system for Samdrup Jongkhar Thromde** will expire on 14th May, 2017, but the project is yet to complete so, we would like to request for an extension of one year for the same. Following are few reasons for the need of extension of the EC:

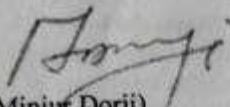
1. Though project period is up to October 2017, but the construction activities will take more than the project period.
2. After completing the construction, some more time will be required for commissioning the work.

Considering the aforementioned reasons, we would like to request your good office for extension of the existing environment clearance.

Please find enclosed herewith:

- The existing environment clearance
- Brief report on the implementation of the EC

Yours sincerely,


(Minjur Dorji)
Executive Secretary

Copy to:

1. Dasho Thrompon, S/Jongkhar Thromde, for kind information.
2. The Project Director, ADB, DES, MOWHS, Thimphu, for kind information.
3. The Project Manager, PIU, SJT for information.
4. The Project Engineer, PIU, SJT for information.
5. The Environment Officer, S/Jongkhar Thromde, for information and follow up.
6. Office copy.

PABX: +975 7 251616, 251619, 251629

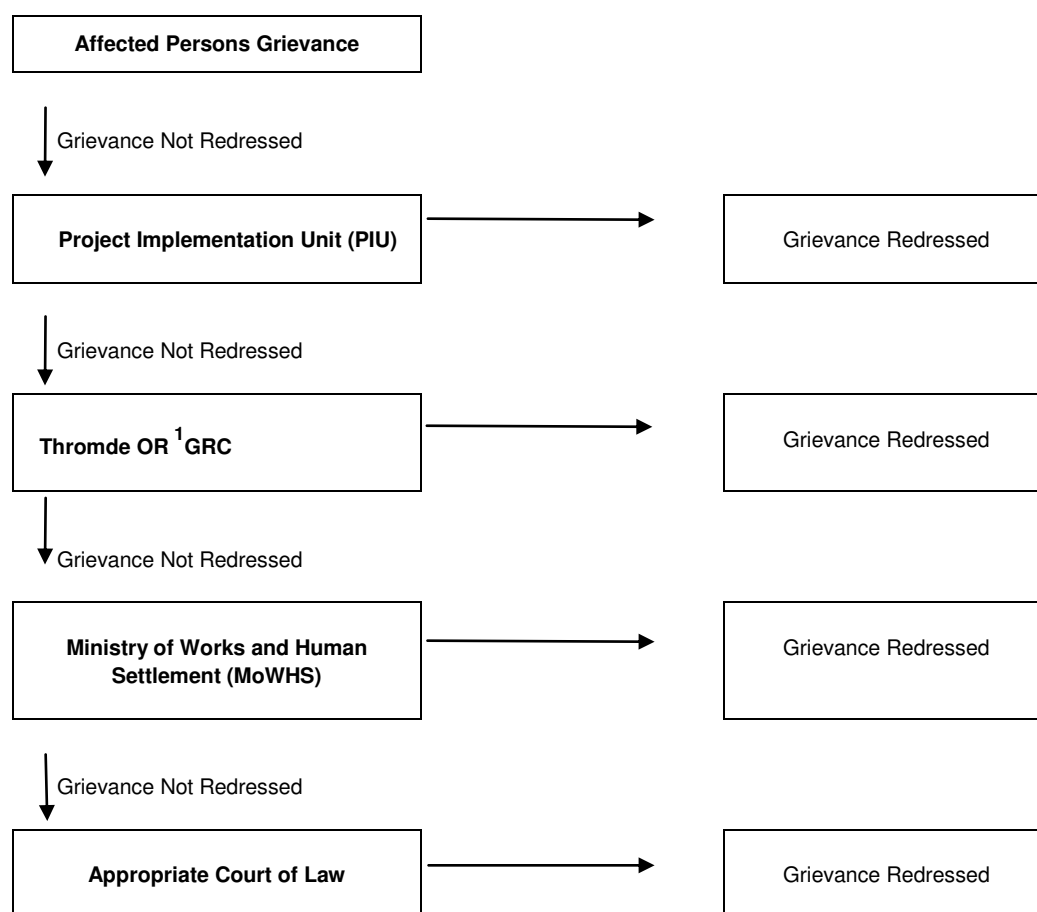
Fax: +975 7 251305

Website: www.sjthromde.gov.bt

Grievance Redressal Mechanism

Grievances of affected persons will first be brought to the attention of the Project Implementation Unit (PIU). Grievances if not redressed by the PIU will be brought to the grievance redress committee (GRC) consisting of local government representative, the head of the PIU and a representative of the affected person. The committee will meet when a grievance is not resolved by the PIU. They will be given notice of the meeting, the need for it to determine the merit of the grievance and to resolve the grievance within a month of receiving the notice. Further grievances will be referred by affected persons to the MoWHS and if not redressed then to appropriate court of law. The flow chart of how the grievance redressal mechanism (GRM) takes steps is as follows;

Figure 1: Grievance Redressal Process



¹ Grievance Redressal Committee